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Recent Advances in Fumigation of Ships

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THE problem of rat eradication on ships has been intensively studied in this country principally by Creel and Simpson,[1] Grubbs and Holsendorf,[2] Akin and Sherrard,[3] and Williams.[4] During the past 3 years, the whole subject has been under review by a commission of the League of Nations coöperating with the Office Internationale d'Hygiène Publique. As a part of their program, systematic studies of fumigation and directly related procedures were carried out at the New York Quarantine Station. These studies form the basis for the present paper.

From data available at the beginning of this study, it was apparent that: (1) only about 10 per cent of ships were persistently and heavily rat-infested, the other 90 per cent exhibiting variable infestation or complete freedom from rats, and (2) that infestation was largely dependent on the extent and depth of rat harborages, maintenance of large colonies being due principally to breeding on board.

These conclusions pointed the way to two distinct lines for investigation. One pursued by Akin and Sherrard[6] was the possibility of segregating ships according to degree of rat infestation, the other to develop more effective fumigation methods for treatment of infested ships. The latter study has taken much time and physical labor. It has involved an intimate and extended study of the details of ship construction, as well as the development of improved methods of introducing fumigating gases.

The fumigants in general use on ships today are hydrocyanic acid and sulphur dioxide. The modern cyanide fumigants are liquid

HCN and Zyklon. The possibilities of sulphur dioxide have not yet been fully investigated and it will be only incidentally referred to in this paper.

Liquid HCN is packed in heavy steel cylinders, from which, for fumigation purposes, it is sprayed by air pressure. The liquid is the most effective and adaptable form of HCN, but requires the most apparatus. It is also the most dangerous to handle.

Zyklon and Zyklon discoids are liquid HCN absorbed in inert material—kieselguhr and wood fiber discs respectively. It is packed in heavy metal cans and used by spraying on the floor.

PENETRATION OF GASES

The first step was to discover, by extensive opening and tearing out of harborages *after* fumigation, the locations wherein rats escaped the gas. A number of specific instances are cited in a recent *Public Health Report*.[5] The net conclusion was that lack of penetration, particularly into dead air spaces, was the principal cause of failure.

Molecular diffusion of gases is a relatively slow process and probably is only a minor factor in the dissemination of fumigant gases. Apparently, this is principally accounted for by convection and by dynamic forces, mainly wind pressure.

When a rat is placed in a small box carefully sealed except for a single ¼" hole, it will pass through a 2-hour exposure to the standard amount of HCN without apparent effect. If one additional ¼" hole is made in the box, a similar exposure will kill the rat. The difference is due to the establishment of an air current.

Rat harborages with only one opening are quite common on ships, those usually most difficult to treat being spaces under floors in the holds and burrows into cold storage insulation. In the latter instance, even injection of the fumigant by compressed air often fails to project it to sufficient depths.

ABSORPTION

It has been shown that bulk materials, particularly when moist, rapidly absorb both HCN and SO_2, but even flat surfaces take up appreciable amounts of gas, the amount increasing as roughness or porosity of the surface increases. The amount of moisture present seems to be most important, though temperature also has a distinct effect.

Absorption influences fumigation by removing gas from the air and thereby reducing the concentration. Within small enclosed spaces where the absorptive surfaces are extensive, in relation to the volume of enclosed air, the gas may never reach a lethal concentration.

In cold storage insulation, the highly porous insulating material absorbs so much gas as to make this a major factor in preventing effective fumigation even by direct injection. In loaded ships, the cargo appears to absorb very considerable amounts of the gas, so much that no allowance in dosage should be made for space occupied by cargo.

HCN CONCENTRATION

There being very little data available as to the amount of gas actually in the air of fumigated spaces, one of the first steps was to develop a simple colorimetric method of determining HCN concentrations. A large number of tests has disclosed that the theoretical maximum concentration is rarely reached and that during exposures there occurs a steady reduction of concentration, very largely dependent on atmospheric disturbance as well as absorption.

Inside of rat harborages, concentration was found to vary greatly. In some it would be as high as in the hold; in others it would be zero. Nor was it always possible to predict, even approximately, what would occur. Entirely enclosed spaces, if no cracks presented, were usually impervious, while the presence of many cracks generally admitted plenty of gas. In dead ends gas was usually sub-lethal, under floors sometimes entirely absent.

TOXICITY FOR RATS

To appreciate the influence of concentration, it is necessary to know the lethal time relationship. Akin and Sherrard,[a] Barcroft,[8] and the writer have found that 1/8 to 1/5 oz. liquid HCN per 1,000 cu. ft. will kill exposed rats in 30 minutes.

It will be seen from this that in a standard fumigation (2 oz. HCN per 1,000 cu. ft.—exposure 2 hours), the dose represents a theoretical concentration of 10 times, and the exposure one that is 4 times the lethal minimum. While in most cases both the amount and the time are more than required, where deep harborage is present even these margins may be insufficient.

RAT HARBORAGES

On ships, rat harborages are of four general types: open, partly enclosed, completely enclosed, and burrows. Nests in the open usually indicate a scarcity or overcrowding of better harborages.

From the viewpoint of the fumigator, harborage is (1) pervious, (2) capable of being opened to insure penetration, and (3) impervious and inaccessible. The last named covers any impervious harborage that cannot be opened without costly damage, or that cannot be reached.

The air jet hydrocyanic acid sprayer

Cold storage and similar insulation was found to present the greatest problem. The insulating material is always a soft substance into which rats burrow long distances. Merely removing portions of the retaining sheathing is of no manner of use; it is essential to open each burrow. In badly infested areas this is tantamount to complete removal of the insulation.

DIRECT INJECTION OF FUMIGANTS

Confronted with the knowledge that the fumigating gas failed to penetrate into many harborages and that a large proportion of these could not justifiably be opened except in the presence of reasonable evidence of plague infection, three lines of procedure were considered and, to a greater or less extent, investigated: to increase the amount of gas, to increase the time of exposure, and to inject the fumigant directly into harborages.

Neither increasing the amount of fumigant nor the time of exposure was desirable. Both increased the cost directly; one also increased the time required. Both were bound up with the problem of maintaining concentration. They are still under investigation. It may be stated now, however, that increasing the exposure from 2 to 3 hours produced a distinct increase in the effectiveness of the fumigations.

The third procedure—direct injection of the fumigant—was promising and has been studied at some length. The first projection apparatus used was a converted vacuum cleaner which was fed Zyklon It was effective but clumsy. The next plan was to force

air through a can of Zyklon and lead it to points of application through a long rubber hose. This method is reasonably effective but has the disadvantage that dosage is inaccurate; at first, the air becomes heavily laden with HCN, but as evaporation proceeds the Zyklon is chilled until finally very little HCN is taken up.

The inaccuracy of the Zyklon method led to the use of liquid HCN, which, while more troublesome and dangerous to handle than Zyklon, is far more adaptable. First efforts were confined to direct spraying within harborages. For this purpose was used a trigger valve controlled sprayer at the end of a supply tube. The apparatus was much improved by replacing the cylinder of liquid with a strong glass bottle which was carried slung from the shoulder. Pressure was supplied in this bottle by screwing down a steel capsule of highly compressed CO_2 onto a hollow pointed needle, which led into the bottle through a check valve.

THE AIR JET SPRAYER

This apparatus, while superior to the Zyklon pump, had the disadvantage that the liquid could not be projected very far, spraying only the immediate vicinity of the nozzle. The next step was to mount air tanks and a compressor on the fumigating boat (similar apparatus may be mounted on a light truck), and to construct an air jet projector. As now in use, this is an oxy-acetylene torch with the liquid HCN, under pressure, attached to the acetylene side and air pressure to the oxygen side, both supplies being controlled by spring valves

Injecting HCN under raised flooring

Rat burrow into cold storage insulation, chalk-marked for direct fumigation. Note loose cork that the rats have pulled out through the opening directly below the cross mark.

operated by a single handle. Experience has shown the best spray is thrown with 100 lb. pressure on each line. A nozzle operated on the atomizer principle throws an equally good spray and can be operated with much less pressure on the liquid line—about 30 lb. In the open, the visible spray is projected about 8 to 10 feet, the invisible vapor much further. This apparatus is an extremely effective fumigating instrument. It, however, has its disadvantages—two of them. One is that it may be too effective, that is, the relatively very large amount of fumigant introduced into a closed space may become a later hazard by failing to dissipate after the fumigation; being inaccessible to the fumigators, they cannot determine the concentration before leaving. The other is that the hose line, full of liquid HCN under high pressure, is a hazard to the fumigator handling the apparatus.

To overcome these disadvantages a return was made to the method of passing air through the fumigant, this time, however, through 18 to 30 lb. of liquid HCN instead of 5 lb. (gross weight) of Zyklon. This has worked well. The lesser surface prevents too rapid evaporation and the greater mass prevents too rapid chilling. Only one hose line goes to the projector, this carrying air laden with HCN vapor, the latter in far smaller amount than is projected by the spray, but quite sufficient for the purpose in hand. Should the line break, the fumigator is sprayed with air, containing HCN vapor it is true, but a very different proposition to a stream of liquid HCN. It is presumed that it is of course realized that when using any of these direct injection apparatuses, the operators wear gas masks.

The air jet sprayer was developed to project the fumigant directly into enclosed spaces. It was at once adapted, however, for general spraying of liquid HCN into holds. In this form it is operated from the deck. The nozzle, being horizontal, shoots the gas toward the sides, while the back pressure causes the nozzle, hanging free at the end of the supply tubes, to fly around in all directions. The result is a thorough distribution, at once, of the gas to all parts of the hold.

PRELIMINARY INSPECTION

All fumigation study, but particularly the development of direct injection apparatus, has more and more emphasized that a preliminary inspection of the ship, as the first step after the fumigating crew comes aboard, is an absolute essential of adequate and effective fumigation. While on the majority of vessels there will be found no harborages requiring direct injection, when they do exist they must be located and marked beforehand. It is too difficult to search them out while wearing a gas mask and carrying an injection apparatus.

On most infested ships, there will be some harborages which will protect rats if undisturbed, but which can be readily opened to admit sufficient gas when detected during preliminary inspection.

RAT-PROOFING

Rat-proofing requires here some mention, but cannot be entered into at any length. It is, however, inextricably bound up with fumigation.

As has been stated, rats sometimes escape fumigation in one or two deep harborages, remaining as a nucleus from which the colony is rebuilt. When these few harborages are eliminated, subsequent fumigation kills all the rats on board and the persistent colony disappears. Such selective rat-proofing has been extremely useful in many cases.

FUMIGATING LOADED SHIPS

In essentials, a loaded vessel presents to the fumigators a ship in which has been placed a relatively enormous, though temporary, rat harborage and one in which the permanent harborage in the holds is covered.

A study of cargoes has shown that they may broadly be divided into package or lump cargo, fine bulk, and bulk liquid. Bulk liquid is in itself dependably rat eradicative and may be passed out of the picture. Finely divided bulk packs into a relatively solid mass, into which gas penetrates but a short distance; fortunately, the same applies to rats. Its worst feature is that it rather completely covers up the permanent harborages.

Package or lump cargo presents numerous interstices into which rats readily penetrate. It has been found, however, that HCN gas will generally reach the rat through any opening through which the rat itself can pass. Dead ends appear to be relatively infrequent, so that the cargo itself is a rather poor protection to rats.

Cargo never fills the holds completely. Always there is a space between it and the deck above, throughout which the gas disseminates. In the case of package or large lump cargo, there are also spaces at the sides and usually along the faces of bulkheads, which permit the flow of gas down the sides as well as over the top, and provide a route for air currents passing through the cargo.

Into the lower levels of loaded holds gas must be introduced by way of the ventilators. When Zyklon is used, the dosage on different levels is inexact. When liquid HCN is used, the delivery tube is guided into each level in turn and exact doses are introduced. Rats under the floors cannot be reached by gas in the holds, but may be

reached through the sounding pipes into the bilges. To date, it has not been thought justifiable to introduce a full dose of HCN via this route, but it is believed possible to accomplish bilge fumigation with a motor-driven blower.

Ventilation of loaded ships has not appeared as a material problem. Accessible portions of holds have been found to clear in about the same time that empty holds will clear, while the inaccesible portions are found clear by the time they are reached in the process of unloading. The exceptions to this general rule have appeared only when the ship's crew closed the hatches *and ventilators* after the departure of the fumigating crew.

To prevent accidents, however, the only reasonable course to pursue after a loaded fumigation is to leave a fumigator as a guard during unloading operations, until he is convinced that gas has disappeared from all parts of the holds. Guards may be kept on rat-infested vessels to collect rats uncovered in and under cargo.

In general, a loaded fumigation carefully performed may be counted on to kill 80 per cent of the rats on a ship. The exceptions that have been noted have appeared mostly on ships in which empty fumigations failed of this degree of effectiveness and on vessels harboring rats under floors in holds.

RAT INFESTATION INSPECTION

No dissertation on improved fumigation methods is complete without at least a few words on infestation inspection. The origin of this procedure in this country was undoubtedly the observation that fumigators were able to predict, at least approximately, the rat yield.

Through careful studies of Akin and Sherrard, since amply confirmed,[7] the signs of infestation—rat droppings, rat runs, rat tracks, and cutting or gnawing—have been classified and evaluated, so that today an inspector can determine, with remarkable accuracy, in a relatively short time, the number of rats on a ship, their location and, in some degree, how long they have been present. The procedure has become of tremendous value in eliminating fumigations of ships already free of rats. It is one of the essential bases of the international quarantine agreement now in effect.

TEST PAPERS

An extremely useful and practical chemical test for HCN concentration has been developed by Sherrard.[9] It consists of dried strips of filter paper impregnated with mercuric chloride, methyl orange, and glycerine in definite proportions. When one of these is dropped into

a hold, it will turn a distinct pink color, readily discernible from the deck, in the presence of HCN. If the color change is not distinct in 2 minutes, the hold may be safely entered by fumigators. The test is quite as reliable as test animals and simpler in every way to use, with the single restriction that the papers after turning pink tend to bleach, even in the continued presence of HCN, so that additional papers must be used for further tests.

FUMIGATION RESULTS

Improvement in fumigation methods should be measured by improvement in results. The measures described herein have been developed, tested, and put into use at the New York Quarantine Station during the past 6 years, the essential figures over which period appear below.

	1925	*1926*	*1927*	*1928*	*1929*	*1930*	*1931*
Rats per infested ship	18.1	22.1	22.0	21.1	21.8	18.0	15.2
Rat-infested ships—per cent of all ships referred to the Fumigation Division	49.1	42.3	30.9	23.0	31.5	24.6	16.0

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Ages of Health Officers in Relation to Professional Training

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ALTHOUGH the age of a health officer is important for several reasons, the present discussion will be confined primarily to its influence on his taking university training in public health. The young physician who has been graduated at a grade A medical school within the past 10 years, as a rule is well grounded academically and medically. He is able to meet university admission requirements and to carry successfully its courses in public health. In view of his remaining years of usefulness, his investment of time and money in public health training should yield a real return.

So much cannot be said for older physicians. Those who were graduated a score of years ago, for example, as a rule are not well grounded in the basic sciences and cannot satisfactorily take most of the university courses in public health. Moreover, there would be less incentive for them to invest time and money in courses of training when their expectancy for vigorous health would be for a comparatively brief period. Experience has shown that physicians not over 35 years of age are most satisfactory as students of public health, but exceptional men up to the age of 40 do reasonably well. While occasionally men above this age may carry courses successfully, in general they find the work difficult and at times embarrassing.

The physician who has grown old while serving as a full-time health officer has had opportunity to acquire a great deal of useful knowledge and practical experience, and even though he may be lacking in certain technical subjects, he may play a very useful rôle in administrative and routine health measures. Until schools of public

TABLE I
CLASSIFICATION BY AGE GROUPS OF STATE AND PROVINCIAL HEALTH OFFICERS, 1932

	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74
48 State Health Officers.....		5	4	8	14	11	4	2
9 Provincial Health Officers.	1	1	1	3	1	1	1	

TABLE II

FULL-TIME COUNTY HEALTH OFFICERS GROUPED ACCORDING TO AGE, 1932

United States

States	Total Number	Average Age	Number				Percentage			
			Under 35	35–40	41–50	Over 50	Under 35	35–40	41–50	Over 50
Alabama	52	45	15	4	11	22	28.8	7.7	21.2	42.3
Arizona	4	57				4				100.0
Arkansas	27	52	3		9	15	11.1		33.3	55.6
California	14	51		2	4	8		14.3	28.6	57.1
Colorado	1	51				1				100.0
Delaware	3	47	1			2	33.3			66.7
Florida	2	42	1		1		50.0		50.0	
Georgia	31	50	4	2	12	13	12.9	6.5	38.7	41.9
Idaho	1	29	1				100.0			
Iowa	3	54			1	2			33.3	66.7
Kansas	10	58			1	9			10.0	90.0
Kentucky	70	46	21	6	10	33	30.0	8.6	14.3	47.1
Louisiana	32	47	5	4	13	10	15.6	12.5	40.6	31.3
Maryland	17	44	1	7	4	5	5.9	41.2	23.5	29.4
Massachusetts	3	40	2			1	66.7			33.3
Michigan	13	42	3	4	3	3	23.1	30.8	23.1	23.1
Minnesota	1	37		1				100.0		
Mississippi	28	44	8	1	11	8	28.6	3.6	39.3	28.6
Missouri	11	51		1	4	6		9.1	36.4	54.5
Montana	4	59				4				100.0
New Mexico	5	47	1		2	2	20.0		40.0	40.0
New York	4	50		1	2	1		25.0	50.0	25.0
North Carolina	30	46	7	2	12	9	23.3	7.7	40.0	30.0
Ohio	43	54	3	3	10	27	7.0	7.0	23.3	62.8
Oklahoma	8	52			3	5			37.5	62.5
Oregon	6	43		3	2	1		50.0	33.3	16.7
Pennsylvania	3	57			1	2			33.3	66.7
South Carolina	24	44	4	3	12	5	16.7	12.5	50.0	20.8
South Dakota	1	44			1				100.0	
Tennessee	36	45	7	4	17	8	19.4	11.1	47.2	22.2
Texas	2	38	1		1		50.0		50.0	
Utah	2	62				2				100.0
Virginia	13	48	2	2	2	7	15.4	15.4	15.4	53.8
Washington	8	62			1	7			12.5	87.5
West Virginia	15	47	3	4	2	6	20.0	26.7	13.3	40.0
Total	527	47	93	54	152	228	17.6	10.2	28.8	43.3

Canada

Provinces	Total Number	Average Age	Number				Percentage			
			Under 35	35–40	41–50	Over 50	Under 35	35–40	41–50	Over 50
Alberta	1	57				1				100.0
British Columbia	3	42	1	1		1	33.3	33.3		33.3
Quebec	24	39	11	5	5	3	45.8	20.8	20.8	12.5
Saskatchewan	1	35		1				100.0		
Total	29	40	12	7	5	5	41.4	24.1	17.2	17.2

health were established, training was obtainable only in the school of experience. As will be observed later, only a beginning has been made by health officers in taking professional training in public health.

Table I presents the age distribution of 48 state health officers and 9 provincial health officers. The state health officers have an average age of 56 and the provincial health officers 52. One provincial health officer is 37 years old. With this exception, all of the state and provincial health officers are 40 or over.

Of the 557 full-time county health officers in the United States in January, 1932, the available records did not give the ages of 30. The age distribution of the remaining 527 is given in Table II. In each of 2 states having 2 and 8 health officers respectively, or a total of 10, the average age is 62. In 10 other states there are 183 health officers with an average age of 45 or less. From Table II it will be noted also that in the group under 35 there are 93 county health officers in 20 states, and that in the 35–40 group there are 54, representing 18 states. These two groups, which may be regarded as including the potential students for schools of public health, have a total of 147. Among the county health officers in the states, 30 have had school of public health training—usually 1 year. As of January, 1932, Tennessee reported 5 county health officers who have had school of public health training, and Maryland 5, whereas 13 other states reported only 1 or 2 with such training.

In Canada, there were 32 county health officers in January, 1932. Their age distribution by provinces is shown in Table II. The ages of 29 were available and averaged 40 years. Of these, 18 have had school of public health training. The record of Quebec is conspicuous, in that the average age of 24 of her 25 county health officers is 39 years, and 14 have had training in a school of public health.

In the United States, of the 966 cities having 10,000 or more inhabitants, only 407 have full-time health officers. Of 249 of these for which we have records, the average age is 52 years. Their age distribution will be found in Table III. Of the 158 full-time city health officers whose ages were not available, 150 are non-medical: 32 in Massachusetts, 51 in Pennsylvania, and 27 in New Jersey.

SUMMARY

1. The age distribution of 862 full-time state, provincial, city and county health officers is as shown in Table IV.

2. Of the 208 health officers under 41 years of age, 38 have attended schools of public health—a percentage of 18.2.

TABLE III

FULL-TIME CITY HEALTH OFFICERS GROUPED ACCORDING TO AGE, 1932

States	Total	Average Age	Number				Percentage			
			Under 35	35–40	41–50	Over 50	Under 35	35–40	41–50	Over 50
Alabama	9	54			3	6			33.3	66.7
Arizona	1	39		1				100.0		
Arkansas	3	50			2	1			66.7	33.3
California	21	51	1	2	5	13	4.8	9.5	23.8	61.9
Colorado	1	60				1				100.0
Connecticut	8	52		1	6	1		12.5	75.0	12.5
Florida	5	52		1	1	3		20.0	20.0	60.0
Georgia	11	53	1		5	5	9.1		45.5	45.5
Idaho	1	56				1				100.0
Illinois	12	52		1	7	4		8.3	58.3	33.3
Indiana	1	47			1				100.0	
Iowa	4	51			2	2			50.0	50.0
Kansas	4	44	1	1	1	1	25.0	25.0	25.0	25.0
Kentucky	6	52	1	1		4	16.7	16.7		66.7
Louisiana	2	65				2				100.0
Maine	7	55		1	2	4		14.3	28.6	57.1
Maryland	4	52		2		2		50.0		50.0
Massachusetts	3	54			2	1			66.7	33.3
Michigan	10	52	2		3	5	20.0		30.0	50.0
Minnesota	2	58				2				100.0
Mississippi	6	42	2		3	1	33.3		50.0	16.7
Missouri	4	61			1	3			25.0	75.0
Montana	3	59				3				100.0
New Hampshire	1	57				1				100.0
New Jersey	4	58			1	3			25.0	75.0
New Mexico	2	49			1	1			50.0	50.0
New York	9	56			3	6			33.3	66.7
North Carolina	14	49	1		6	7	7.1		42.9	50.0
North Dakota	1	53				1				100.0
Ohio	19	53		2	6	11		10.5	31.6	57.9
Oklahoma	4	43	1		2	1	25.0		50.0	25.0
Oregon	3	49		1	1	1		33.3	33.3	33.3
Pennsylvania	6	53			3	3			50.0	50.0
Rhode Island	2	63			1	1			50.0	50.0
South Carolina	5	43		1	4			20.0	80.0	
South Dakota	1	44			1				100.0	
Tennessee	5	43	1	2		2	20.0	40.0		40.0
Texas	9	47	3	1	1	4	33.3	11.1	11.1	44.4
Vermont	1	82				1				100.0
Virginia	9	49	1	2	2	4	11.1	22.2	22.2	44.4
Washington	6	58			1	5			16.7	83.3
West Virginia	9	49	3			6	33.3			66.6
Wisconsin	11	53	1	2	2	6	9.1	18.2	18.2	54.5
Total	249	52	19	22	79	129	7.6	8.8	31.7	51.8

TABLE IV

AGES OF 862 FULL-TIME HEALTH OFFICERS

Kind of Health Officer	Under 35	35–40	41–50	Over 50	Total
State			9	39	48
Provincial		1	2	6	9
County (*U. S.*)	93	54	152	228	527
County (*Can.*)	12	7	5	5	29
City (*U. S.*)	19	22	79	129	249
Total	124	84	247	407	862

3. In the age group under 35 there are 124 health officers, of whom only 25 have had university training in public health.

4. University courses should be supplemented by practical field training. As the age group 41–50 is at a decided disadvantage with respect to university courses, practical intensive courses should be offered for them.

5. Although the total number of health officers having diplomas in public health is still quite limited, the number taking the training and planning to take it is showing a yearly increase.

NOTE: The Directory of the American Medical Association was the source of our information as to the ages of health officers, and the *Public Health Reports* were consulted to ascertain the city health officers who are physicians and those who are not.

Eye Defects in the Savage

IN the recent film called "Trader Horn" there were about 200 savage African tribesmen, especially imported from Africa by Hollywood. A group of eye specialists in California examined the eyes of every one of these men, with this interesting result: that the respective percentages of near-sightedness, far-sightedness, myopia, and other common eye defects were almost the same as the averages for men and women of America. Undoubtedly the abuse of our eyes is the cause of much defect in vision, yet this study of the savages' eyes shows that the human eye has a natural tendency to imperfection.

Studies on Ringworm Funguses with Reference to Public Health Problems*

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THE type of skin infection commonly known as ringworm has long been a problem met by the physician treating skin diseases. During recent years this has come to be recognized as a matter of real concern for officers responsible for the administration of certain types of public institutions patronized by large numbers of our population. The high incidence of this type of infection has been repeatedly observed and pointed out. During the past 3 years studies have been carried on at the University of California at Berkeley, by Drs. Robert T. Legge and H. J. Templeton, of the Earnest V. Cowell Memorial Hospital, and the writers of the Department of Botany.† Certain aspects of the work have been,[6] or will be reported elsewhere, while the results of laboratory studies on certain phases of the work are herewith given.

The funguses causing this type of infection are found in the epidermis and the hair growing on infected areas of the body. Skin scales and hair are separated from these lesions and bear the hyphae, Figure I, which are viable and capable of starting a new growth of the fungus given favorable conditions.

Such fungus bearing material is especially apt to be dislodged in dressing rooms and in showers. These infectious materials on the floors of rooms used by numbers of individuals form a ready source of infection for the feet of other persons. The high incidence of this type of infection on the feet of persons using such rooms certainly lends very strong evidence to the support of this as a common method of spread.

Is the fungus material so deposited capable of making actual growth on the floor surface and so multiplying the possible source material for infection? These funguses are well known to be keratin

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loving organisms growing vigorously on materials such as hair, wool, silk, horn and feathers. Data as to their ability to grow on other types of natural materials are very scarce. An effort has been made to collect evidence as to the possibility of growth on materials such as are to be commonly found on the floors of dressing and shower rooms. Repeated examinations have consistently shown the presence of quantities of hair in any cracks in floors, between boards, under lattice work drain boards, and under mats or in cracks in cement.

Microscopic examination of hair from such situations, where there is sufficient moisture, will often show the presence of fungus growth on and in the hair. This type of fungus growth has not been demonstrated to be that of a dermatophyte, due to the great difficult of isolating these comparatively slow growing organisms from such material. Material consisting of hair and other debris from the cracks in floors was brought into the laboratory, moistened with distilled water, and sterilized. Pure cultures of a number of species of ringworm funguses were planted on such material, and all yielded growth, showing that such material, when afforded sufficient moisture, will serve as admirable food material for the growth of these funguses.

The question as to whether these dermatophytes are able to make actual growth on wood as do many other funguses has lacked a satisfactory answer. Specimens of new sound wood of different types,

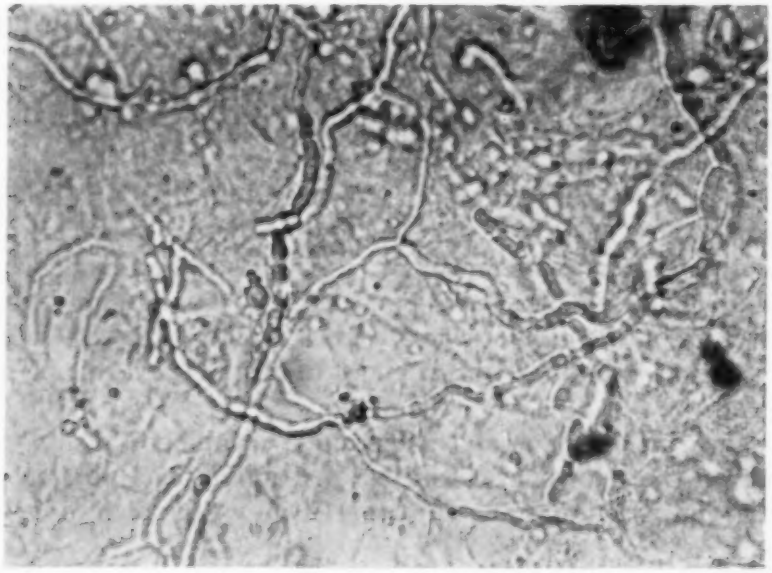

FIGURE I—Photomicrograph showing mycelium of *Trichophyton interdigitale* imbedded in skin scale

oak, Douglas fir, and pine, were sterilized in flasks after moistening with distilled water, and then inoculated from cultures of a number of species of dermatophytes. These cultures were kept under conditions favorable for possible growth for 6 months' time, but there was no detectable development of fungus in any of the cultures.

Samples of wood were taken from the floor of an outdoor pavilion where the floor boards were somewhat weathered and discolored on the surface due to some years' exposure, but were still apparently sound. These were placed in bottles with distilled water and autoclaved. Blocks of sound new wood were prepared as checks. These were inoculated with fragments from tube cultures of *Trichophyton interdigitale* Priestley, and kept at room temperature. No growth on sound new wood of check. Twelve samples of weathered wood were used. Growth of the fungus developed on three blocks. The growth was very slow in developing and somewhat limited in its extent.

Those failing to show growth were examined by reculturing on agar medium from the inoculum placed on the block, and positive cultures showed that the fungus was viable, but unable to grow except on certain blocks, these apparently affording the food material necessary while others did not. This demonstrated that such old weathered wood may possibly support a growth of this type of fungus.

A point of equal or greater importance to be considered, is whether these funguses may possibly grow on material accumulating on the surface of the floor regardless of the type of floor considered. Surfaces that are subject to frequent wetting tend to accumulate a film or coating of slime. This may in some cases, when not thoroughly cleansed at frequent intervals, show a greenish color due to the growth of algae.

Portions of sound boards, blocks of cement, and bricks that had been thoroughly soaked by continued exposure to wetting for some time, and showed an accumulation of such slime, were taken into the laboratory, placed in culture chambers, and sterilized. The surface was inoculated with a pure culture of *Trichophyton interdigitale,* and they were held at room temperature. A very evident and rapid growth of the fungus resulted (Figs. II and II A). Scrapings of algal growth were made and this material was sterilized and then inoculated with pure cultures. Rapid and abundant growth of the fungus resulted. It is therefore evident that any accumulation of such algal or bacterial slime on the floor or beneath floor mats or drain racks will afford materials for the actual growth and development of this type of fungus, and such growth yields spores readily distributed on any object coming in contact with it. Cracks and fissures in floors would

FIGURE II—Sound wood covered by brown slime, 2 weeks after inoculation with *Trichophyton interdigitale*

FIGURE IIA—Cement block covered with thin greenish slime, 2 weeks after inoculation

often retain sufficient moisture between times of wetting to sustain the growth of the fungus. The cultures shown in Figure II were allowed to dry out in the laboratory and remain dry for 6 months. Subculturing from the surface of these after such drying yielded positive cultures, showing that the fungus may remain viable over rather long periods of ordinary drying. It is, therefore, evident that such growth may remain as a source of dissemination of the fungus over indefinite periods of time.

It appears evident from the data here presented that an important factor in the possible prevention of infection is the elimination of conditions that will permit the possible growth of fungus on floors. Hosing down floors will not be sufficient to remove such material, due to the tenacity with which such materials adhere to the floor. This will be especially true of material under mats and grill work sometimes found on floors and runways. Thorough scrubbing at frequent intervals will be of prime necessity, and possibly the application of disinfectants to the floors.

A series of tests has been made on the action of disinfectants on growths of these funguses in such materials as are found on floors. The materials most likely to serve as food for the growth on floors are: hair, accumulations of slime and algal growth, and skin scales. The

preparations used must be such as to be non-irritating to the feet, and the cost of the materials such as to make application practicable.

Zinc chloride solutions are known to have high fungicidal properties, and are used widely as wood preservatives for the prevention of the growth of wood destroying fungus.[9] Tests on the action of zinc chloride solutions were made as follows: cultures of *Trichophyton interdigitale* were grown on bundles of human hair in culture tubes. When there was vigorous growth on these hair cultures the bundles of hair were laid on blocks of wood that had been placed in large culture dishes and sterilized. Before sterilization the blocks were wet with the zinc chloride solution and enough of the solution provided so that the blocks were about half covered by the solution.

The growing cultures were laid on the surface of the moist blocks, and time allowed for the diffusion of the disinfectant into the hair mat, without immersing it in the solution. This treatment would more nearly approximate the conditions to be met with on a floor surface than would be the case if the growing cultures were simply immersed in the disinfectant solution. Portions of the hair mat were removed at intervals and subcultured for growth of fungus, and results are shown in Table I.

TABLE I

ACTION OF ZINC CHLORIDE SOLUTIONS ON CULTURES GROWING ON HUMAN HAIR

Per cent $ZnCl_2$	No. of tests	Time of exposure									
		1 hour		1 day		2 days		4 days		7 days	
		Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.
13.6	3	3	0	3	0	3	0	1	2	0	3
6.8	13	13	0	12	1	11	2	5	8	0	13
5.0	6	6	0	4	2	4	2	4	2		
5.0	5			4	1	3	2	1	4	0	5
2.0	11	11	0	11	0	11	0	10	1	10	1

The killing action was due to the permeation of the hair mats and strands by the zinc chloride. This penetration was checked by removal of the hair mats after killing and repeatedly washing in distilled water. Tests for chlorides gave positive results after repeated washings, showing that there had been extensive penetration of the hair mats.

The results of these tests show a high degree of killing by this agent, in concentrations of 5 per cent or more. The time necessary for killing is rather long, but the high degree of impermeability of the hair, within which much of the fungus material is encased largely accounts for this slow action. It seems that the application of this compound might be advisable to wooden floors, especially in dressing rooms, where the salt would be concentrated in the surface of the wood by evaporation of the water. This residue would then serve to inhibit any fungus growth in organic materials accumulating in cracks in the floor, and apt to become moistened occasionally. Zinc chloride would not seem an advisable disinfectant for the floors of shower rooms, where they are subject to frequent flooding, as it would be washed away before it had time to be effective.

Tests were carried out using some other probable disinfectants, applying them more particularly to accumulations of slime on the surface of wood or blocks of concrete, such as are shown in Figures II and IIA. These slime covered blocks were sterilized in bottles or wide culture dishes, containing small amounts of distilled water, and then inoculated with pure cultures of *Trichophyton interdigitale*. After 2 weeks' time, when a vigorous growth of the fungus had developed on the surface of these blocks, they were transferred aseptically to vessels containing the disinfectant. They were completely immersed in the disinfectant and shaken to insure, as much as possible, thorough contact of the solution with all parts.

After 15 minutes' exposure the blocks were removed to sterile containers and allowed to drain. Subcultures were made at that time in nutrient broth tubes. The blocks were allowed to stand in the containers, and subcultured again after 24 hours. The results of these tests are shown in Table II.

TABLE II

ACTION OF DISINFECTANTS ON FUNGUS GROWING ON THE SURFACE OF SLIME COVERED BLOCKS

Material	Time	1 Per cent Sodium hypochlorite		1 Per cent $CuSO_4$	
		Positive	Negative	Positive	Negative
Wood blocks	15 min.	11	3	7	0
Wood blocks	24 hrs.	7	17	7	0
Brick	24 hrs.	0	4		
Concrete	24 hrs.	0	4		

The sodium hypochlorite solution was prepared from standard commercial solutions on the market. The copper sulphate solution was prepared by using the common hydrate $CuSO_4 \cdot 5H_2O$.

The results here shown, although for a small number of tests, indicate that sodium hypochlorite solutions must remain in contact with this material for a considerable period of time to be appreciably effective. The copper sulphate solution is entirely ineffective in the concentration, and for the time intervals used. These results strongly indicate that the probabilities of attaining successful disinfection of such surfaces are slight, unless the disinfectant is to remain on the surface for at least a number of hours. The disinfective action will evidently be in inverse ratio to the amount of organic matter on the surface, and this emphasizes the need for a high degree of cleanliness on such floor surfaces.

A series of tests on the action of sodium hypochlorite on dermatophytes imbedded in skin scales was made. Fragments of skin were collected from cases that on culturing yielded a high percentage of postive cultures of *Trichophyton interdigitale* and *Epidermophyton cruris*. These fragments were soaked in a 1 per cent solution for varying periods of time, washed in sterile water, and planted on nutrient agar. The results are show in Table III.

It is obvious from these results that a high percentage of killing of these funguses is attained only after exposure to the solution for 1 hour or longer. This becomes an important point in connection with the use of such solutions in foot baths. This same sodium hypochlorite solution shows a complete killing action on spore suspensions of these funguses in 5 minutes in dilutions up to 1–5,000. The degree of disinfection attained depends on the readiness with which the solution comes in actual contact with the fungus hyphae. The fungus material imbedded in hairs or in skin scales is encased in material that

TABLE III

DISINFECTANT ACTION OF 1 PER CENT SODIUM HYPOCHLORITE ON SKIN SCALES INFESTED BY DERMATOPHYTES

Organism	Control		Time of exposure					
			10 minutes		30 minutes		60 minutes	
	Plants	Positive	Plants	Positive	Plants	Positive	Plants	Positive
Trichophyton interdigitale	60	33	50	18	50	11	50	3
Epidermophyton cruris	30	14	60	10	10	7	60	0

is very highly impermeable to anything in a watery solution, and this is a fact that must be kept in mind in this work.

Another method of avoiding the possibility of infection from the floor is by the use of bath shoes, to prevent the feet from coming in contact with the floor. Such a procedure is followed in certain institutions, and the evidence to date is such as to lend very strong support to this procedure.[6b] The enforcement of regulations concerning the wearing of shoes in public institutions adds to the troubles of the officers in charge, and may be difficult in some instances, but the wearing of shoes will eliminate to a very high degree the possibility of the bather coming in contact with the infectious material.

Bath shoes are of various types and materials, such as rubber, paper, leather, and wood. Laboratory tests have shown that the dermatophytes are capable of making growth on leather (Figure III) when it is kept moist, although such growth is exceedingly slow, and many tests have yielded negative results.

Attempts to grow fungus on strips from rubber bathing shoes have shown that it was not able to grow on sponge rubber such as is commonly used in bathing shoes, but one series of tests showed growth on the fabric lining from rubber bath shoes (Figure III). These shoes had been used for some time, and the growth of the fungus might possibly be accounted for by the accumulation of organic matter in the fabric, or by materials with which the fabric was impregnated. This idea is advanced, since we have been unable to demonstrate that these funguses are capable of digesting clean cellulose material. Similar tests made on material from old bathing shoes that were made of sponge rubber alone have yielded only negative results.

THE DISINFECTION OF CLOTHING IN RELATION TO POSSIBLE PREVENTION OF INFECTION

Due to the nature of this disease it is evident that clothing, towels, and bath mats used by individuals suffering from this type of infection may readily bear skin particles permeated by the living hyphae of these funguses. This has been quite generally accepted as a condition of fact; and where such clothing is subject to common laundering there is a strong likelihood that the infectious material may be generally distributed to the articles so handled. This is the basis for the name commonly applied to this type of infection in one country where it is known as "dhobie itch." The name, dhobie, is that applied to the native laundryman.[1]

It can be readily demonstrated that these funguses are able to make vigorous growth on wool and silk fabrics, when there is sufficient

moisture present, Figure IV. They actually grow in and on the strands of the fabric and digest them, so that eventually there is a breakdown and disappearance of the material of which the fabric was composed. Repeated tests of this type have failed to yield evidence that these funguses are able to attack and digest the cellulose materials of cotton or linen fabrics. Certain statements may be found in the literature [3,4] to the effect that they may grow on cotton, but no definite experimental data are given to support this in any report that has come under our survey. Physiological studies show that they require certain types of complex organic nitrogen compounds as a source of nitrogen for their development, and these substances are entirely lacking in materials made up of cellulose.

It is not likely that there would be sufficient moisture in soiled clothing to support an active growth of these funguses in the fabrics under the conditions commonly met with in handling such clothing, although certain cases have been reported where such seemed to be true. There are, however, rather frequently reported cases of infection of the hands of persons engaged in the handling of soiled clothing, as in local laundries.

Studies have been carried on during the past 2 years on the possible disinfecting action of standard laundry and dry cleaning processes on clothing or fabrics bearing viable fungus material.

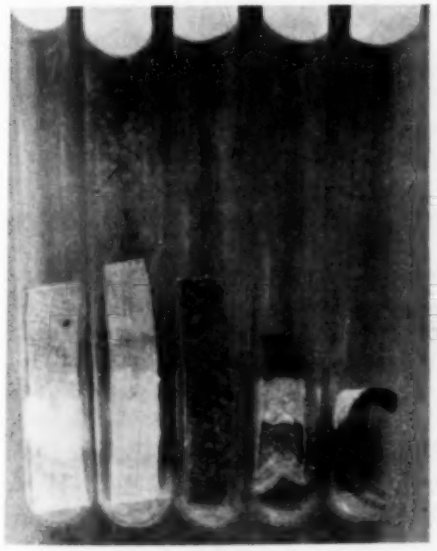

FIGURE III—Two on left showing growth on fabric lining of rubber bath shoe; center, no growth on sponge rubber; 2 on right, growth on leather from shoe. Age of culture, 6 weeks

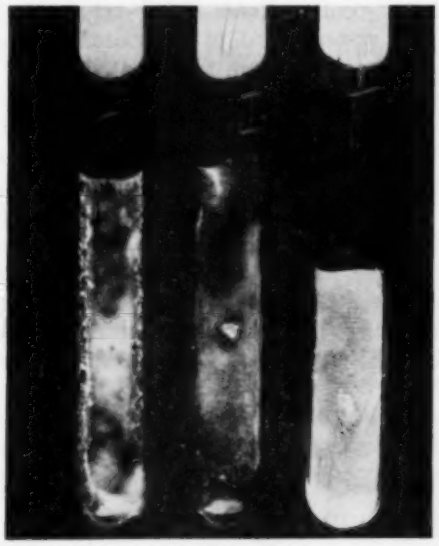

FIGURE IV—No discernible growth on cotton, beyond mass of inoculum

TEMPERATURE STUDIES

In an attempt to demonstrate the effectiveness of standard laundry methods in incidental disinfection of articles that carry dermatophytes, the temperature factor is obviously paramount. Verujsky [10] reported results on thermal death point studies on spore suspensions of *Trichophyton tonsurans* and *Achorion schoenleinii*. He recorded the first killed after 10 minutes at 49° C., the latter not killed in the same time at 50° C. Weidman [11] reported results of some studies on the temperature necessary to kill a number of the species of dermatophytes in culture, and a brief mention of tests on one species when the material was imbedded in skin fragments.

The funguses used in our tests were: *Trichophyton interdigitale* Priestley, *Trichophyton rosaceum* Sabouraud, *Epidermophyton cruris* Castellani, and *Microsporon lanosum* Sabouraud. These were all grown in pure, bacteria free cultures, and tests were made as follows:

Cultures were grown on agar slants in test tubes until abundant sporulation was obtained. The time necessary for spore formation varies somewhat with different species, but the cultures used varied in age from 15 to 40 days. Spore suspensions were made by introducing into the culture tube a small quantity of sterile distilled water, and then gently working up a spore suspension from the surface of the colony with a soft platinum wire. This spore suspension was then taken off into a sterile tube and agitated to get a homogeneous suspension. Culture tubes were prepared, each containing 10 c.c. of a nutrient solution made up with 1 per cent peptone and 1 per cent glucose.

Five-tenths c.c. of the spore suspension was introduced into each culture tube, and the tubes were then heated for 10 minutes in a water bath which had been brought to the desired temperature. The temperature was read from thermometers held in blank tubes of the same size and containing the same amount of solution. The time interval was reckoned from the time at which the solution within the tube containing the thermometer reached the desired temperature.

At the end of the 10 minutes' exposure the tubes were cooled by immediate immersion in an ice water bath, to insure that the cultures were not exposed to a higher temperature for more than the 10-minute period. Controls were run for each test in tubes inoculated from the same spore suspension and incubated without heating. These cultures were then incubated at room temperature after treatment, and the results read after 14 days. For results see Table IV.

It is a well known fact to students of the dermatophytes that there is a considerable amount of variation in the morphology of these funguses when grown under different cultural conditions. When grown in liquid mediums there is a very considerable development of mycelium without any conidia formation for a period of time. Under certain conditions, especially as the cultures become older, there is a very abundant formation of chlamydospores in the hyphae. Thermal death point studies were made on the four above named species, using

TABLE IV

CONIDIOSPORES (ALEURIES)
TIME OF EXPOSURE 10 MINUTES

Temperature	*T. interdigitale*		*M. lanosum*		*E. cruris*		*T. rosaceum*	
	No. of tests	Positive	No. of tests	Positive	No. of tests	Positive	No. of tests	Positive
75° C.	14	0	2	0				
70	26	6	12	0			2	0
65	24	7	20	1	2	0	2	0
60	24	16	26	5	2	0	8	0
55	24	22	22	12	2	0	14	0
50	16	16	18	18	11	0	19	5
45			14	14	16	9	20	20
42					12	12		
control	15	15	14	14	5	5	7	7

young colonies of vigorously growing mycelium a few days old, before any spores were formed. Another series was run on material from old cultures in which a large percentage of the hyphal cells were rounded and swollen to form chlamydospores, but where conidia formation had been suppressed. The results of these tests made with several dozens of trials for each species showed that the thermal death point for both the young mycelium, and the chlamydospores was consistently a little below that for the conidia shown in Table IV. Since this was found to be true we are reporting here only the results on that phase requiring the higher temperatures to accomplish complete killing.

Cultures Growing on Wool—To each of several 125 c.c. Erlenmeyer flasks 50 c.c. of distilled water was added. To each flask was added 30 small squares (approximately 1 cm. in width) of white Botany flannel. This fabric is a closely woven all wool material. The flasks were sterilized and then inoculated with spore suspensions of the funguses and set aside until profuse growth had taken place, covering all the pieces of the fabric. Microscopic examination showed that the funguses had very completely permeated the fabric, and in some cases the fabric was seen to be digested away to a considerable degree. The squares were then transferred separately to tubes and heated as described above. After heat treatment they were transferred to agar slants and observed for subsequent growth. For results see Table V.

Cultures Growing on Hair—Thick bundles of human hair were placed in test tubes with 3–5 c.c. of distilled water, sterilized, and then inoculated with spore suspensions of the funguses. After sufficient growth had developed (2 to 4 weeks,

TABLE V

CULTURES GROWING ON WOOL
TIME OF EXPOSURE 10 MINUTES

Temperature	*T. interdigitale*		*M. lanosum*		*E. cruris*		*T. rosaceum*	
	No. of tests	Positive	No. of tests	Positive	No. of tests	Positive	No. of tests	Positive
70° C.	12	0						
65	20	2	2	0				
60	22	6	14	0	18	0	12	0
55	24	13	20	2	21	0	12	0
50	24	23	20	4	21	0	23	0
45	18	18	18	12	22	12	23	22
42	6	6	12	12	4	4	11	11
control	5	5	5	5	5	5	5	5
CULTURES GROWING ON HAIR								
65° C.	6	0	6	0				
60	18	0	6	0	24	0	18	0
55	18	0	12	0	24	0	24	1
50	18	11	18	0	24	0	24	7
45	18	18	18	15	24	23	18	18
42			18	18	12	12	6	6
control	2	2	2	2	2	2	2	2

varying with the species) the entire growth was removed to sterile Petri dishes. The portions of the hair showing abundant growth were selected and separated into small units. These showed abundant growth on and in the hairs when examined under the microscope. Small wisps of infected hair were placed in broth tubes and heated, except for those used as controls. After heating they were cultured on agar slants and observed for further possible growth (see Table V).

Skin Scales Infested with Fungus Material—Since it is obvious that clothing and bath room fabrics used by individuals bearing this type of infection will carry skin fragments infested with these funguses, a series of tests were made to determine the temperature necessary to kill them in this condition. Collections of skin scales were made from patients and tested by laboratory culture. Those showing a high percentage of positive cultures from a number of plants were selected for test materials. The scales were cut into small fragments and subjected to heat treatment for 10 minutes in tubes of distilled water, then taken from the tubes and planted in agar plates. The results from these tests are summarized in Table VI.

TABLE VI

THERMAL DEATH POINT OF TWO SPECIES OF FUNGUS IMBEDDED IN SKIN SCALES. TIME 10 MINUTES

Organism	Control		Temperature							
			50° C.		55° C.		60° C.		70° C.	
	No. of plants	Positive	No. of plants	Positive	No. of plants	Positive	No. of plants	Positive	No. of plants	Positive
Trichophyton interdigitale	70	50	70	22	40	0	60	0	20	0
Trichophyton rosaceum	20	2	20	2			20	0	20	0

A consideration of the data here listed shows that the dermatophytes are not very highly resistant to heat treatment as applied under moist conditions. The killing temperature is shown to vary somewhat for the different species, *Trichophyton interdigitale* showing the greatest heat resistance, with *Microsporon lanosum* in second place. The effective temperatures here recorded are slightly higher for *Trichophyton interdigitale* than that recorded for complete killing of this species by Weidman,[11] but agree with his findings in that this species is more heat resistant than any other used. Our results and those of Weidman do not agree with the statement of Mitchell,[8] who asserts: " I have been able to culture *Epidermophyton inguinale* from tissue which had been brought to the boiling point in 15 per cent KOH, and obviously ordinary laundering would not kill this organism."

One factor that merits consideration at this point, is the degree of wetting of the material to be treated. In making up spore suspensions one often sees clumping of spores in and about air bubbles in the liquid, and the spores so situated would not be so quickly heated as those more isolated in the liquid. Tests made with *Trichophyton interdigitale* showed that when the spore suspension was shaken with glass beads, decanted, and made up in a more homogeneous suspension, the thermal death point was 5 degrees lower than that shown in our table. Since such a procedure could not be followed in ordinary disinfecting practice it seems better to depend on the figures shown in the table. Practically all laundry treatment of fabrics involves the use of soap, and soap solution serves to lower greatly the surface tension of the bath, and so facilitate complete wetting of all particles.

A number of tests have been made on the possible fungicidal action of soaps. Spore suspensions were made up in 1 per cent soap solutions

(on the basis of dry weight), and allowed to stand for periods of 5, 10, and 15 minutes. Subsequent culturing of these spores on a nutrient medium showed no detectable killing or inhibiting action by the soap. Heating of spore suspensions in such soap solutions showed that the temperature necessary for killing action on *Trichophyton interdigitale* is between 60° C. and 70° C. These tests indicate that there is no appreciable fungicidal action exerted on these funguses by the ordinary soaps that are used in the bath for fabrics, although soaps have been shown to have bactericidal action in such baths, by the work of Elledge and McBride.[2]

THE EFFICIENCY OF STERILIZATION OF INFECTED ARTICLES BY STANDARD LAUNDRY ROUTINE

Practically all owners of power laundries in the United States are members of the National Association of Laundry Owners. This body functions to promote the establishment of a standard routine procedure most in keeping with the satisfactory functioning of the business, and this standard routine is more or less adhered to by power laundries throughout the country. By reference to their *Manual*[5] it is found that soiled articles undergo various treatments, which differ primarily according to the fabric, color, weave, and to some extent to the degree to which they are soiled. As the public demands the return of visibly clean and undamaged goods, the laundry finds it necessary to employ the most tempered process that will accomplish this result.

The standard process prescribed for moderately soiled white cotton and linen articles (knitted wear excluded) may be summed up with reference to temperature as follows:

> During washing and rinsing such articles are subjected to temperatures of approximately 100° F. (38° C.) for 10 minutes, 120° F. (49° C.) for 5 minutes, and 150° F. (65° C.) for 40 minutes. Soap and soda ash are added to the first two baths. Dirty bundles are subjected to a temperature of approximately 195° F. (90° C.) for 25 minutes. After washing and rinsing the treatment varies with the nature of the article, being either ironed, pressed, or sent to the drying room. Articles ironed or pressed are subjected to a temperature of approximately 320° F. (160° C.) for a short time, while those in the drying room are at 212° F. (100° C.) for approximately 15 minutes.

It is seen from the above that there is little chance of the survival of any of the dermatophytes in view of their heat resistance as shown in the laboratory tests.

Colored cotton articles (except hosiery) are treated as follows:

> They are washed for 10 minutes in a bath containing soap and soda ash at 100° F. (38° C.) and this is followed by three 10-minute washings at 120° F.

(49° C.). Rinsing is carried out at this same temperature for about 15 minutes. Following this they are ironed, pressed, or sent to the drying room.

It cannot be stated with certainty, from the viewpoint of the heat resistance of the organisms that this treatment will kill *all* dermatophytes that may be present, although it is obvious that killing would be very nearly complete.

Colored cotton socks, knitted cotton underwear and woolens receive a common type of treatment during the washing process.

The first washing is in soapy water at 100° F. (38° C.) for 25 minutes, and this is followed by three rinsings of 5 minutes each at the same temperature. The subsequent treatment again depends on the nature of the fabrics. Since drying at high temperatures causes shrinkage, these articles are not subjected to such high temperatures, nor are they held in the warm bath for such long periods of time as are common cotton articles.

There is no standard procedure for silks, because of the great variation of articles received. Nevertheless, the washing and rinsing temperatures never exceed 100° F. (38° C.), and excessive temperatures for drying or ironing processes are avoided. Silk mixtures and artificial silks are treated as is pure silk.

From the above account it can readily be seen that the killing of the dermatophytes in colored cotton socks, wool, and silk articles is extremely doubtful. It is on such articles, moreover, with the exception of towels, that the occurrence of the infected material is most frequent, because of the nature of the disease.

THE EFFECT OF DRY CLEANING SOLVENTS ON DERMATOPHYTES

Certain types of clothing that are not laundered are subjected to "dry cleaning." Such articles from individuals infected by these funguses may carry infectious material, and recommendations have been made [7] that soaking these articles in dry cleaning solvents would serve to clear them of the infectious material. Such treatment has been recommended for woolen socks to prevent reinfection of cases under treatment. The substances more commonly used for dry cleaning solvents are hydrocarbons, such as gasoline, kerosene, and benzene. Carbon tetrachloride is a component of certain cleaning mixtures.

A series of tests has been made to determine the action of these solvents on four species of dermatophytes. Cultures of the funguses were grown in flasks on fragments of wool fabric and on hair until the mycelium had thoroughly permeated the material. The materials bearing these were removed to dry sterile filter flasks and dried in a 32° C. incubator for 5 days, until they were quite dry. They were then flooded with an excess of the cleaning solvent, and agitated to

insure a complete wetting of the surface of the fibers and hyphae of the funguses by the cleaning agent. The agent used in these tests was Cleaners' " naphtha." After the desired time exposure the fluid was poured off and the wool and hair materials completely dried by passing through the flasks a current of air that had been filtered free of micro-organisms. The particles were then removed to culture tubes containing a nutrient medium, and observed for subsequent growth, and their identity was checked. The results of these tests are shown in Table VII.

TABLE VII

RESULTS OF THE EXPOSURE OF GROWING CULTURES TO "NAPHTHA" AND SUBSEQUENT RECULTURING

Time in solvent	*T. interdigitale*		*M. lanosum*		*E. cruris*		*T. rosaceum*	
	No. of tests	Positive	No. of tests	Positive	No. of tests	Positive	No. of tests	Positive
CULTURES GROWING ON HAIR								
15 min.	54	54	30	30	30	15	30	30
30 min.	29	29	30	30	30	3	30	30
60 min.	30	30	30	30	60	7	30	10
control	3	3	3	3	4	4	3	3
CULTURES GROWING ON WOOL								
15 min.	30	30	30	30	25	25	30	30
30 min.	30	14	30	28	20	14	30	10
60 min.	30	21	30	10	18	3	30	9
control	4	4	3	3	4	4	4	4

It is seen from Table VII that there is very little killing action in these species under 1 hour of exposure, and in no case is it complete in 1 hour's time. The percentage of killing is higher with *Epidermophyton cruris* than with the other three species; this species also gives less vigorous growth on hair than the others used.

Tests of the action of naphtha, kerosene, and carbon tetrachloride on spore suspensions showed no appreciable killing action after 5, 10, or 15 minute exposures.

Tests of the possible killing action of some dry cleaning solvents on mycelium of these funguses imbedded in skin scales were made. It is in the skin scales that the fungus material lodged in clothing will

almost always be found. The action of the solvents on such scales will serve to give us a rather accurate measure of their disinfectant action.

TABLE VIII

RESULTS OF SOAKING SKIN SCALES BEARING *Trichophyton Interdigitale* IN SOLVENTS AND SUBSEQUENT CULTURING

Solvent	Control		Time of exposure							
			30 min.		60 min.		90 min.		120 min.	
	No. of plants	Positive	No. of plants	Positive	No. of plants	Positive	No. of plants	Positive	No. of plants	Positive
Naphtha	20	7	20	3	20	4			20	4
Kerosene	30	12					20	8		
Carbon tetrachloride	20	7	20	7	20	4			20	5

The results recorded very clearly demonstrate that there is at best a very light disinfectant action by dry cleaning solvents on the ringworm funguses that may be borne on the clothing treated.

There is considerable variation in the procedure followed in the handling of articles to be dry cleaned, depending on the nature of the garment, the degree to which it is soiled, and the equipment of the cleaning establishment. In the better equipped standard establishments the treatment for a great many routine articles is immersion and agitation in the solvent for from 1 to 1¼ hours. Where the articles are immersed they must be subsequently dried, and there may be a very appreciable sterilizing action from the drying process, although the temperature is kept in all cases well below 100° C.

SUMMARY

1. Attempts to grow fungus on sound clean wood have yielded only negative results.

2. Fungus may grow readily on floor material that is covered by a coating of slime or algal growth.

3. Results of the application of certain disinfectants to growth on slime covered blocks of floor materials are given.

4. The complete killing of *Trichophyton interdigitale* borne in skin scales, by 1 per cent sodium hypochlorite solution requires a time period of 1 hour or longer.

5. Thermal death point studies on spore suspensions, cultures grown in fabrics, and on material imbedded in skin scales show complete killing of the fungus in 10 minutes' time at 75° C., or lower in some cases.

6. The efficiency of the fungicidal action of standard power laundry practice is shown to vary with the nature of the fabric handled and with the temperature applied to the different materials. The standard practice for white cotton fabrics shows a good margin of safety, while that employed for woolens and colored fabrics is doubtful.

7. The application of standard "dry cleaning" solvents to these funguses, either growing in fabric, or imbedded in skin scales, is shown to have a negligible killing action, in exposures of 1 to 2 hours.

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Bulgarian Parents and Teachers Organize

THE International Federation of Home and School announces the organization of the National Union of Parents and Teachers of Bulgaria, which plans the publication of pamphlets of information and the organization of lectures on the principles and methods of the home and school movement.

Health—Where Can It Be Taught?*

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THE writer's chief qualification for preparing this paper, dealing with a subject involving such diversity of opinion and practice as health teaching in the senior high school, is perhaps that he has no ideal course or perfect program to suggest. For more than 10 years we have been experimenting in the development of health education methods in the City of Malden, but we began with the lower grades completing a program for each successive grade upon the basis of the pupil's previous training. The result is, that we have only within the last year begun the study of the senior high school.

Certainly it is a sound principle for the public school to begin its health training in the lowest grade and develop health behavior as rapidly as possible, gradually increasing individual responsibility as the child becomes older and supplying him from grade to grade with the supporting facts which make health behavior reasonable and which will enable him as an adult to determine sound health procedures when confronted with new situations.

It is unscientific, even if not uncommon, to consider the high school program without reference to what has been done in the lower grades. Communities which have not established a good health education program in the lower grades may need a temporary high school program based upon the need of the present generation of high school pupils. Such a program should be regarded as temporary, however, and should be changed with the changing needs of the pupils. It would be absurd to build a health education program by deciding first what instruction would be interesting to present in the senior high school and pass out those things which are left to the lower grades.

It is easier to form right habits in the first place than to replace bad habits with good ones. Moreover, only a small percentage of children reach senior high school. Both of these facts point to the obvious desirability of carrying each child as far as possible in health training in each grade. We must build the high school program as

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a protecting roof of knowledge and further individual adjustment upon the best structure we have been able to develop up to that time.

We will do well to consider some of the other principles of health instruction which apply both to high school and lower levels.

1. We must recognize the importance of a fresh approach in succeeding years of instruction. In health education we are training children—not merely presenting information. The fact that a habit is once established does not warrant the assumption that no further attention needs to be given to that item of behavior for the remainder of the school life of the child. It may be more difficult to maintain health practices at a higher grade level than it was to establish them at an earlier age. In any training program an appreciable amount of repetition is necessary. This makes obvious the necessity for some new material and a fresh approach in each succeeding year.

The program which we have developed experimentally in Malden may be used to illustrate what we mean by keeping a fresh approach. In the first 2 grades the program is one of informal health habit training without the attempt to present information as such. In the third grade a health reader is used as a guide to the health training program and the pupil is held responsible for a small amount of health knowledge. In the fourth grade the pupil has his first textbook which emphasizes the "how" of health training, with an appreciable increase in the number of health habits or details of behavior considered. In the fifth grade the pupil continues health training with the study of the "why" of health practices considered in terms of illustration and analogy from his own field of experience. In the sixth grade the new approach to health is through the consideration of the biological approach to cleanliness as it concerns the individual and the home.

Definite health instruction is maintained throughout the junior high school with its departmentalized program. This is practical and logical. The child demands further information to support the continued program of health training and a large number of these children will have no opportunity for schooling beyond the junior high school. In grade 7 the pupil goes forward from his recent study of cleanliness in the home to a consideration of the elements and principles of community health, both rural and urban. It is not difficult to associate instruction in personal habits with this subject, and this study, properly related to the work in civics, helps to build a citizen who will support suitable public health activities in his community. In grade 8 the pupil studies elementary physiology based upon a simple knowledge of structure and function and is given as

I. In every high school the extra-instruction experi-

much information as is practicable for the individual who is without a knowledge of physics, chemistry, and general biology. In grade 9 a study of home nursing and child care is required of all girls. We are considering the possibility of developing instruction in food values and in first aid for the boys.

This summary shows not only the care which has been taken to secure a fresh approach, but also the kind of health background possessed by an increasing number of high school pupils as one city and county after another establish their own well-organized education programs in the lower grades. A course in senior high school in which subject matter and methods are mere repetition will be flat, stale, and unprofitable. There is serious danger of pitching health instruction in high school at too low an intellectual level.

2. We recognize that, although there are certain minimum general standards of health behavior, there is no single set of health rules which is satisfactory to all individuals. In the lower grades we are largely concerned with bringing the child up to some of these minimum standards. In the upper grades we should be increasingly concerned with showing him the difference between health rules and individual needs, in order that his lack of understanding may not develop a disgust for all general principles of health, and that he may study his own physical limitations and learn to live within them. The high school encourages rational action based upon principles rather than on propaganda.

3. We recognize also that health is taught not in the hygiene class alone but through *all* the experiences of the child. The pupil's 10 minutes with the school physician, for example, may contribute the most important piece of health instruction for the year. With this fact in mind, we recognize that the maintenance and conduct of school activities and the health material presented through other subjects of instruction are vital elements in teaching health.

Perhaps you are saying that most of the time has been spent in discussing everything but the senior high school program. When a jig-saw puzzle is put together except for one piece, the shape of the latter is perhaps better understood than as though it were described separately with reference to the other elements which make up the picture.

Our considerations lead us to the inevitable conclusion that health is taught in the senior high school in 3 ways: (I) Through the experiences of the pupil outside of class instruction, (II) Through health instruction correlated with some other subjects, and (III) Through direct instruction in hygiene courses.

I. In every high school the extra-instruction experiences of the pupils inevitably influence their present and future behavior in the right or in the wrong direction. There is neither time nor necessity for discussing in detail the school's responsibilities in this field. They include:

(a) Maintenance in school of those standards of sanitation which we teach as desirable. How often the failure to provide suitable handwashing facilities, sanitary conditions in toilet rooms, the sanitary distribution of drinking water, or the maintenance of satisfactory cleanliness convinces the pupil that the school does not really believe the things which it teaches!

(b) The provision of a medical, nursing, and dental service which approaches its task with a human consideration of the individual, with sufficient time allowance to function efficiently, and the purpose of demonstrating the constructive place of medical science in the life of the individual—rather than a hurried, mechanical, impersonal piece of scientific machinery which considers communicable disease and physical defects with little thought for the personality of the pupil or the attitude toward medical science which is being formed.

(c) The hygienic arrangement of the program, and the best possible coöperation with the home to make the pupil's school day hygienic. Here we have problems involving the length of the school day; the provision of suitable food, relaxation, and recreation; limitation of the pupil load and of extra-school activities; and the development of proper mental, social and emotional health among pupils through a type of school management which will provide right experiences.

II. The teaching of health through correlation is fundamental and important. It shows the pupil that health is a part of life, that healthful living is not a fad of the doctor or of the hygiene teacher but something which has the support of all intelligent people.

The activity program in physical education provides an unusual opportunity to contribute to the maintenance and further improvement of health behavior, constructively, indirectly, and without preaching. It is most important that a clear and coöperative understanding should be developed between the physical education program on the one hand, and health education with its ramifications into all activities of the school health program on the other.

The natural sciences, especially biology, and the social sciences, especially history, have unusual opportunity to provide instruction which will explain and support health principles and extend the appreciation of health values. Most subjects of instruction in the

senior high school can make some contribution to health, and in every course due consideration should be given to mental and physical health in developing the schedules and methods of instruction.

III. What should be done in direct health instruction? We believe that the answer to this question will be found in study and experimentation. Valuable studies and suggestions regarding the high school health program have been made.[1, 2] Doubtless many schools are now experimenting in direct health instruction. From extensive, honest, scientific investigation we shall get the best answers. The problems and the courses needed are not the same for all communities.

Various types of courses have been offered in the past. Some schools have given a course in health or hygiene in each year of the senior high school. We doubt the feasibility of this for pupils who have been exposed to a thorough health education program in the lower grades.

Some schools have provided elective courses for girls, touching the field of personal and social hygiene, under the direction of a teacher or nurse with the proper science and social background and with distinct and recognized ability. Under the direction of the right type of individual these courses have been very successful. The need of instruction in social and sex hygiene at the high school age level presents an important, difficult, and delicate problem, although the approach to such instruction is undoubtedly easier than it was a few decades ago. The apparently successful experiences of Dr. J. R. Earp in teaching social hygiene to mixed groups of college age is interesting, in this connection.* Probably the time has not yet arrived to teach social hygiene in the high schools under that name or to teach it at all except at the election of pupils in separate groups of girls or boys. Much can be done in the presentation of scientific facts and in the development of right attitudes without any direct reference to sex hygiene.

It seems likely that our first experiment in direct health instruction in senior high school in Malden may be with a problem course for seniors who are not going to college. It will deal with those problems soon to be faced by the individuals as workers, citizens, and parents. Such a course, we feel, should relate to local and personal problems and be conducted in a sense after the seminar method, with the selection of specific problems to which pupils will bring the answer for consideration and discussion. It may be that we shall find that this

* Forthcoming article to appear in the report of the Denver, 1931, meetings of the Health Section of the World Federation of Education Associations. Address Miss Sally Lucas Jean, Secretary, 200 Fifth Avenue, New York City.

is not a sound or practicable answer to the need for some direct health instruction.

In summary then, we must recognize that health instruction in the senior high school must depend in large measure upon what has gone before, that whatever is presented must be largely new in material or approach, or both, and that the health teaching which is possible through pupil experiences outside of class instruction and through correlation may be more important than that which comes through direct instruction. This makes it clear that health education in the senior high school is in a large degree an administrative problem and this in turn suggests the importance of a health committee or a health counselor to assist the principal in meeting his responsibility for the development of an ideal health program.

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Welfare Measures for Employed Boys and Girls, Czechoslovakia

A NATIONAL council for the protection of working boys and girls has recently been organized by the Ministry of Social Welfare of Czechoslovakia. This council consists of 18 representatives of young workers' organizations and is functioning under the chairmanship of the chief factory inspector. It is coöperating with 26 local councils, the organization of which is similar to that of the national council; the chairmen of the local councils are the district factory inspectors. In making the appointments to the councils, the minister of social welfare gives preference to persons with experience in social welfare work.

These councils are working on various questions arising out of the employment of boys and girls; jointly with the factory inspectors they enforce the labor laws as applied to boys and girls; they take part in the work of the public agencies for vocational guidance, vocational training, and protection of apprentices, and engage in general welfare work for boys and girls.—Lehrlingsschutz, *Jugend und Berufsfürsorge*, Vienna, May, 1932.

Medical Participation in Public Health Work

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SOME activities now included in the program of most health departments can be transferred gradually to the general practitioner of medicine. In the interest of child health, in so far as practical, the family physician should become a practitioner of preventive as well as curative medicine. He should take an interest in seeing that his clients are protected against smallpox, typhoid fever, and diphtheria, and that adequate periodic physical examinations are made. The public health service should stimulate interest in extending postgraduate instruction to the general practitioner of medicine to interest him in this type of service, and also to establish reasonably uniform methods of procedure." [1]

"The health department inaugurated in Detroit, in 1928, a program of participation by the general medical practitioner in official public health procedure, the ultimate objective of which was to secure the sympathetic and whole hearted support of the medical profession in order that the general practitioner might not only practice curative medicine but actively take his part and share his responsibility in the preventive medical program. A campaign to secure protection against diphtheria, for young children, more especially the preschool child, was used to interest and stimulate response from the general practitioner." [2]

ESSENTIALS OF PROGRAM

The essentials of a program may be briefly enumerated as: (1) actual medical participation; (2) preparation of the medical profession; and (3) preparation of the public.

Success depends upon a complete understanding between the local public health organization and the medical profession (as expressed through the department of health and the county medical society). Few, if any, medical societies are organized with suitable personnel or finances to carry through a program without the assistance of the health department organization. The two major parties

to the enterprise are: first, the public as represented through local government and specifically the health department; and second, the medical profession as represented through its organized society. While health councils may be desirable in certain communities, they are not essential if the health authorities and medical society will take the initiative, assume the lead, and coöpt such other agencies as have special interest in parts of the program—as for example, the tuberculosis society and other community health organizations and lay representation through such organization as the local chamber of commerce. In the dental field the local dental organization must participate. The medical society can best serve through a public health committee whose action should be reviewed by the council of the society. Every step should be worked out with the sympathetic support of the medical society and all new developments should be submitted to the society for its approval prior to final adoption by the health department.

Preparation of the Medical Profession—This involves: (1) a complete understanding by the membership of the local medical society and of district societies, if there be such; (2) the establishment of postgraduate medical conferences; (3) the employment of medical coördinators; (4) undergraduate instruction.

There must be continuous contact between the health department and the public health committee of the medical society, with regular meetings at least bi-weekly. Every opportunity should be available to present the program at the general meetings of the society and at the meetings of the district societies. Special meetings of the participating or coöperating physicians have been found desirable.

Postgraduate medical conferences in communicable disease control for the recognition of early cases of tuberculosis and for the discussion of periodic health examinations should be instituted. These should be designed to attract the physician interested in therapeutics but afford a splendid opportunity to instruct the physician concerning the newer methods of disease prevention. Such conferences have been held in Detroit during the past 3 years and at 10 conferences on communicable disease control there was an average attendance of 235 physicians and, all told, one-third of the membership of the medical society attended some of the lectures. This has created a sympathetic profession, and has not only served as a forum of instruction in modern preventive medicine, but has had the added effect of making better diagnosticians of the physicians and assisted in making more widespread, current knowledge concerning the treatment of communicable diseases. The medical conferences have been built around

the personnel of the communicable disease hospital, whose clinical facilities and staff have been drawn on freely.

There are, unfortunately, certain physicians who never or seldom attend medical meetings of any character and continue to practise medicine of the vintage of the days of their medical school. The employment of medical coördinators to visit such physicians in their own offices has assisted materially in preparing physicians.

In communities which support a local medical school, instruction should be given to the senior class both in the administrative mechanics of the program and in clinical demonstration of the treatment and control of communicable diseases.

Preparation of the Public—In addition to the preparation of the medical profession, the health department must actively pursue a program of popular health instruction directed (1) to the public as a whole, and (2) to the individual.

To secure maximum accomplishment in the actual practice of preventive medicine involves three-cornered coöperation of the public, the medical profession, and the department of health. All the known means of general health education should be employed, including such tools as the radio, newspaper stories, newspaper advertising, bill-board and street-car placards, talks to professional, business, social, and lay groups, and the generous distribution of educational material.

Individual education depends primarily upon home visitation by public health nurses (or other educators). Such system of visitation has been found extremely profitable in increasing the per cent of immunization of young children against diphtheria and has served to stimulate parental interest and responsibility. A personal letter addressed to the parent when the child attains the age of 6 months, followed within 10 days or 2 weeks by a home visit by a public health nurse, has materially increased the number of children under 1 year of age who visit the office of the participating physician and secure protection against diphtheria.

DIRECT OBJECTIVES

While the principal purpose of the program is medical participation, and instruction of the public to look toward the family physician for preventive as well as curative medical service, the direct objectives may briefly be summarized as (1) the protection of a high percentage of children between 6 months and 10 years of age against diphtheria, (2) vaccination for smallpox, (3) periodic health examination, and (4) periodic dental examination.

Diphtheria Prevention—Any health department which does not

organize itself to make available through the office of the family physician the facilities now recognized as available to the modern health department is missing its opportunity.

In Detroit, 1,100 physicians have become actively interested in preventive medicine. No free clinics exist for diphtheria immunization. In the fall of 1929, a communication sent jointly by the medical society and the health department was addressed to every physician, inquiring whether he would coöperate in the campaign by setting aside definite hours during which he would receive at his office, children in need of protection. It was agreed that the physician would charge $1.00 for each dose of toxin-antitoxin or toxoid in those cases in which, in his judgment, the patients were able to pay for the service. The charge for the Schick test and the reading of the results would likewise be $1.00, making a total of $4.00 for the service.

There was nothing in this plan that would prevent the physician from charging his usual office fee if the patient appeared at any hour other than that specified in the agreement. It was further agreed that when, in the physician's judgment, the parent was unable or unwilling to pay for the service, the health department would reimburse the physician at the rate of $.50 for each treatment and $1.00 for the Schick test, or $2.50 for the complete service to each child.

Under such agreement a list of coöperating physicians was established and the city was divided into 35 districts and a card was prepared for each district, listing the name and office address of each physician and designating the hours at which he would receive children for immunization. These lists were used for the convenience of contacting patient and physician and, more especially, by the public health nurses, who later canvassed the entire city.

The result has been that approximately 70 per cent of the preschool children and 80 per cent of the school children have received protective treatments without the use of free clinics. During the past 3 years this procedure has become accepted by the public and physicians, and is automatically bringing about the protection of a high percentage of the child population with a corresponding reduction in the diphtheria death rate.

The program of diphtheria protection has so awakened the interest of the physician in preventive service that during the past 3 years the percentage of preschool children protected against smallpox has increased from 22 to 43. It is obvious that protection against smallpox can be secured in the same manner as protection against diphtheria without the use of free clinics.

The next logical step in the program of medical participation is to secure a periodic health examination for individuals at all ages (from the infant to the adult). Of particular significance to the health department is the effort to find the minimal (or childhood type) case of tuberculosis. During the past year there has been built up in Detroit a group of 400 coöperating physicians who are interested in diagnosing early tuberculosis in children. The tuberculin test followed where indicated by a physical examination and X-ray study has been available at the office of the coöperating physician.

The same general procedure and educational program as described for diphtheria has been followed with the single exception that the health department had no funds with which to reimburse the physicians for non-pay patients. There is being instituted a system of reporting periodic health examinations and vaccinations for which report the health department is paying the physician $.10 as a contribution against the bookkeeping costs. The county medical society has assumed the responsibility of making the periodic health examinations in schools.

A committee of the District Dental Society has placed in operation a service which involves (1) dental inspection of school children, (2) service for indigent adults, (3) part-pay service for semi-indigent children, and (4) regular pay service for children financially able to meet the usual fee. A list of coöperating dentists has been established and the health department participates in the educational program and in financing the mechanics of the program.

ADVANTAGES OF THE PROGRAM

To the Medical Profession—Advantages may be briefly summarized as (1) the elimination of free clinics; (2) increase in medical care to the 98 per cent of the population which is supposedly in good health and in normal times employed and better able to pay, which should result in decreasing service to the 2 per cent of the population which is ill at a given time; (3) joint direction and supervision of the program by the medical profession and the department of health; (4) maintenance of professional relationship between physician and patient; and (5) payment to physician at a reasonable rate for service rendered.

To the Public—Advantages to the public are briefly (1) a reduction in needless sickness; (2) a reduction in the cost of medical care through the prevention of disease; (3) the assurance of obtaining good medical care in connection with preventive services; (4) distribution of cost, so that those financially able make complete payment

while the load for the indigent is spread on the public tax roll; (5) the stimulation of parental interest and responsibility in disease prevention and the maintenance of personal health.

To the Health Department—The advantages to the health department are briefly (1) a reduction in morbidity and death rates, and (2) a conservation of public funds. Since, with the elimination of preventable diseases, the limited health department funds can be used advantageously elsewhere.

DISADVANTAGES

From the general viewpoint of medical care, the principal disadvantage of the Detroit plan is that it has been applied only to preventive medicine.

Basically, the plan involves two principles: (1) organized service, and (2) group payment for certain parts of the population. These same principles are fundamental to a program of curative medicine. The details of their application will not be discussed at this time but suffice it to say that their application does not mean any system of state medicine such as has been created abroad. It does involve group purchase of medical service through taxation for the lower wage earning classes. Organized medicine involves practice with available hospital, clinic, laboratory, X-ray, and research facilities. Such facilities already exist in most urban communities with varying plans of application. In rural districts a method of group purchase by taxation will readily provide an organized medical service which can be made attractive to the physician and beneficial to the public.

Several observers have also indicated that they object to the cost of the procedure in so far as diphtheria protection is concerned. It is recognized that the initial cost is high because the number of children in need of service is relatively high. Each succeeding year reduces the cost. Under no circumstances should the cost be charged solely to diphtheria protection but rather to a program of medical participation which will bring increasing dividends. However, in the Detroit experience in no year has the preventive service including payment to physicians exceeded the cost of hospitalization of the 50 per cent of reported cases of diphtheria hospitalized by the Department of Health. Therefore, the city, through its health department, is saving money.

Another disadvantage which should be mentioned is the difficulty of directing such a program. The medical profession by intuition and by training may not be prepared for such an undertaking but only time and mutual understanding between the medical society and the department of health can overcome such obstacle.

One other real difficulty is the time factor. It is granted that free clinics will receive more prompt response from the public but it has been demonstrated that in the course of 3 years one city has been able to bring about the protection against diphtheria of as high a percentage of its susceptible population as has any other city of equal size through the agency of free clinics.

None of the disadvantages are insurmountable. They are heavily out-balanced by the advantages.

REFERENCES

1. *Public Health Organization*, White House Conference Report, 1932, p. 49.
2. Geib and Vaughan, *The Physician as Health Worker*, *J.A.M.A.*, 97:366 (Aug. 8), 1931.

Safety Congress

THE Twentieth Annual Safety Congress and Exposition will be held in Chicago, October 12–16, 1932. The various sectional sessions will include Automotive, Cement, Chemical, Child Education, Community Safety, Construction, Delivery, Taxicab and Bus, Electric Railway, Fire Prevention, Food, Foremen's Forum, Home Safety, Industrial Health, Industrial Nursing, Laundry and Dry Cleaners, Marine, Metals, Mining, Packers and Tanners, Paper and Pulp, Petroleum, Power Press, Public Utilities, Quarry, Refrigeration, Rubber, Textile, and Woodworking and Lumber Manufacturing, and several sessions on Traffic.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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DO NOT LET UP IN HEALTH WORK OR FUNDS FOR HEALTH WORK

EARLY in his administration, the President of our Association sent out a letter calling attention to the dangers of the depression in regard to public health work, and urging that funds for such work should not be cut down. Instead of getting better, as some of our political optimists have prophesied so many times, the depression has grown worse and from practically every part of the country we get reports of depletion of funds for health work and the discharge of those engaged in it.

It, therefore, seems wise once more to call attention to the dangers of such a course. We are compelled to admit freely that, so far, the health of the people has not been affected as seriously as was anticipated, since 1931 was one of the healthiest years on record. This fact does not, however, satisfy public health people that damage is not being done, especially to children, and there is little question that this will be evident as time goes on whether things change for the better quickly or not. It is a source of satisfaction to us that our affairs are in such good order from the standpoint of health and health organization that we have been able to stand what we have been through without perceptible bad effects, at least as far as nutrition goes.

Other studies, however, have been made that show unmistakably the effects of the financial depression. One of the most interesting of these has to do with the mental health of the nation. More than 100 of the 173 state hospitals have been investigated by means of a questionnaire. While some of these show an increase in new admissions and re-admissions running as high as 20 to 35 per cent respectively, which are traced in part to the depression, when they are carefully analyzed and all factors taken into consideration, those who specialize in this branch admit that there is no rising tide of admission which can be ascribed to the prevailing economic conditions. Psychiatrists are convinced that they are seeing the results of an accumulation of strains rather than the effects of one particular factor. There is, however, a very marked change, directly traceable to the depression, in paroles and discharges. In every part of the country hospitals for mental diseases are having great difficulty in paroling and discharging patients who are well enough to leave. Work is hard to obtain. The families of the patients are in bad condition financially; so they object to receiving mental incompetents back again. It is stated by the Association Secretary of the National Committee for Mental Hygiene that paroles and discharges have diminished from 5 to as much as 20 per cent, in spite of the fact that some superintendents are making every effort to discharge patients when they are fit to go out.

Another result which probably shows the influence of several factors is shown in the birth rate, which is the lowest since the registration area was established in 1915. The 1930 rate was 19.8, while that for 1931 was 17.8 per 1,000 population. It hardly seems doubtful that the depression has had something to do with this. At the same time, the infant mortality rate has been very low, 61.7 per 1,000 live births.

Another feature which is good, as far as deaths and disability go, but is sinister in its origin, relates to occupational fatalities, which have declined 12 per cent from the figures of 1931. Every principal cause of accidental injuries has shown a marked decline, except automobile accidents, which increased 21 per cent. The fact back of this decline which would otherwise be welcome, is unemployment, there being at least 7 million unemployed in this country at present, while some estimates are much higher. By the same token, unemployment has added greatly to the worries, as well as the work of health departments, so that no comfort can be derived from the decrease in industrial accidents. There can be no doubt that there is much evidence of nervous and mental maladjustment, due to the depression, occur-

ring particularly among those who have been hardest hit, the unemployed and their families. Our suicide rate has risen markedly, showing the highest figure on record, except for one year just after the World War.

It is perhaps unfortunate that the statements here made will be read principally by those who already understand the situation and are working with us for a common object, the protection of our budgets for health work. We can only urge that every opportunity be taken to point out the facts to the proper authorities and to work personally, as well as otherwise, against cutting of budgets for health work. The Congress has adjourned without passing the emergency relief bill continuing and extending the help which was given for the drought area in 1931. In one state, alone, some 40-odd health workers have been left without employment. Their work which was calculated to produce permanent value has been discontinued. There is no question that a similar situation is more or less general, inquiry revealing that among more than 200 health departments there has been an average reduction in budgets of 7.4 per cent, some running as high as 43 per cent. Large cities have suffered most but counties and states have also been hard hit.

A NEW JOURNAL

THIS *Quarterly Bulletin* has been brought into existence in order to make the material emanating from the Health Organisation of the League of Nations more generally available. It is not, however, an official organ and the Health Organisation does not assume responsibility for the opinions expressed in it, except when so stated.

The first volume is full of interesting material, beginning with the Resolutions of the Conference on Immunisation Against Diphtheria. Next there is an excellent report on Medical Education in England by Sir George Newman, and after that a report on the "Milk Supply of North-American Cities" by Professor R. Burri, Director of the Swiss Federal Institute for Milk Industry and Bacteriology. "Tropical Pneumonia" occupies 40 pages, followed by an excellent bibliography.

Perhaps the most interesting chapter is "A Second Analytical Review of Reports from Pasteur Institutes" on the Results of Anti-Rabies Treatment, by Lieut.-Col. A. G. McKendrick. Space permits only a brief summary. This second report which deals with the year 1929, covers 69,709 treatments which he compares point by point with 31,656 previously given.

Of those treated with killed vaccines, 0.80 per cent developed rabies, live vaccines 0.26 per cent, heated vaccines 0.15 per cent. Treatment paralysis was observed in only 6 cases. The incidence of paralysis for most vaccines corresponded closely with those given in the first report, while for dried or glycerinated vaccines the proportion fell from 1 in 464 to 1 in 5,302.

Non-Europeans run a much higher risk than Europeans—0.88 against 0.13. They are usually more severely bitten and on exposed parts of the body, treatment is commenced less promptly, and the biting animals prove more often positive. No evidence of special racial susceptibility has been discovered and there is no decisive evidence of the superiority of one method of treatment over another. An appendix gives the figures of the treatment at Sassari by Fermi from 1900 to 1930. Between 1900 and 1907, 700 persons were treated by the original Pasteur method, 2 of whom developed rabies, but they were both bitten on the bare skin of the head and in neither case was treatment commenced until the third week. From 1907 on, 3,974 persons have been treated by sero-vaccine and no case of rabies was developed. All persons treated were Europeans.

This volume ends with a survey of the Floods in China and the work undertaken by the Medical Director of Health against epidemics. Altogether the bulletin is most useful and we welcome its appearance.

REFERENCE

League of Nations, *Quarterly Bulletin of the Health Organisation.* American Agency: World Peace Foundation, 40 Mt. Vernon Street, Boston. Price $2.00 per year. Single copies $.50.

ASSOCIATION NEWS

61ST ANNUAL MEETING, WASHINGTON, D. C.

Scientific Trips

THE Association meeting this year offers an unusual opportunity for delegates not only to visit those places of national interest in the field of politics, religion, science and the arts, but to observe some of the governmental operations in the fields in which the members of this Association are peculiarly interested. Since the customary and popular points of interest are well known to many of the delegates and will be elsewhere completely described, this article is intended to set forth in brief fashion the inspection trips which will be available. The local committee has attempted to make these interesting generally to representatives of all of the sections.

For the public health statisticians the Division of Vital Statistics of the Bureau of the Census will demonstrate the operation of improved machinery for the mechanical tabulation and recording of vital statistics, and if time is available special motion picture films will be shown.

The public health engineers will be afforded an opportunity to visit the Dalecarlia filtration plant which includes the modern rapid filters, pumping station laboratory, hydro plant, and alum manufacture. Another trip includes the sewage pumping station and District incinerators where the mosquito control operations of the U. S. Public Health Service will be explained by these officials.

At the National Institute of Health can be seen a number of scientific projects including the study of nutrition with special reference to the prevention of pellagra, the investigation of typhus and Rocky Mountain spotted fever, tularemia, and meningococcus meningitis. The Institute is also conducting immunological studies on diphtheria, tetanus, and botulinus, and is officially charged with the testing of certain commercial biological products.

Students of nutrition will be interested in the laboratories conducting research along this line in the Bureau of Chemistry and Soils, the Food and Drug Administration and the Bureau of Home Economics of the United States Department of Agriculture, as well as in the Bureau of Fisheries of the Department of Commerce, so far as marine products are concerned. These trips will also be extended to inspect the laboratories and technicological work carried on in the Bureau of Dairy Industry and the Bureau of Animal Industry of the Department of Agriculture.

The Army Medical Center is composed of the Walter Reed General Hospital, the Army Medical School, the Army Dental School, the Army Veterinary School, and training schools for dietitians, physiotherapy and occupational therapy aides. These schools are engaged in research and teaching and the medical and veterinary schools make many biological products on a large scale—typhoid vaccine, mallein, tuberculin, rabies vaccine, etc. All of these departments and schools will be open to inspection and those interested in a particular phase of laboratory investigation can arrange for special visits.

The extensive library of the Surgeon General is in the Army Medical Museum where it is planned to arrange a special exhibit showing a graphic history of public health in the Army, as well as some special laboratory apparatus.

Optional trips can be arranged for St. Elizabeths Hospital, the Naval Medical School, and for the Children's Bureau of the Department of Labor, the work of which will undoubtedly be of interest to the members who are concerned with vital statistics, child hygiene, public health education, and public health nursing.

A special trip immediately following the close of the meeting has been arranged to visit the School of Hygiene and Public Health of Johns Hopkins University at Baltimore. The activities of this institution should enlist the attention of epidemiologists and public health officers; in fact, the School of Hygiene should appeal to all interested in public health in its many aspects.

Other points of interest at Baltimore where provision will be made to receive visitors are the Johns Hopkins Hospital, the Welch Memorial Library, and the laboratories of the State Department of Health and the City Department of Health.

Some of the Government buildings and laboratories will be within easy walking distance of the Willard Hotel and no special arrangements for transportation will be made. For places more remote, bus transportation is to be provided. The trip to Baltimore is a special trip, the cost of transportation to be defrayed by the individual members. Considerable reductions in round trip railroad and bus fares are available for those who will return to or through Washington.

Information in detail and the schedules for all inspection trips will be available at the registration desk.

SCIENTIFIC EXHIBIT OF THE INDUSTRIAL HYGIENE SECTION

FOR a number of years, exhibits have been an important feature of the Annual Meeting. Whether sponsored by commercial organizations or otherwise, they are always educational.

The Association has experimented with extensive popular health "shows" to which the public has been invited, notably at Chicago in 1928, and at Minneapolis in 1929. While these were well attended and occasioned favorable comment, the general feeling has been that exhibits entirely technical in character and designed to interest professional public health workers were more in keeping with the professional spirit of the American Public Health Association.

No one section of the organization has sponsored an exhibit up to this time. For the Washington meeting the Industrial Hygiene Section is arranging one to illustrate the progress and problems in preventive medicine in industry. There will be nine units of space covering more than 650 square feet.

The U. S. Bureau of Mines has been allotted four units to portray some present-day industrial hazards. Scientific apparatus will demonstrate methods of dust collection. Conditions induced by dust will also be demonstrated. These important exhibits are under the direction of Dr. R. R. Sayers.

Dr. Louis Schwartz of the U. S. Public Health Service has accumulated a mass of data as a result of his numerous studies of skin diseases in various industries. He draws on his experiences and records in arranging his exhibit on Industrial Dermatoses.

Recognizing the possible hazards resulting from the increasing use of certain toxic gases and volatile liquids in industry, the Committee on Exhibits has invited Dr. E. R. Hayhurst to demonstrate apparatus for determining the presence of poisonous gases. Part of Dr. Hayhurst's exhibit will deal with occupational diseases in Ohio, with special emphasis on Silicosis.

The American Social Hygiene Association's exhibit "Syphilis in Industry" will indicate the importance of syphilis as an industrial hazard, with suggestions as to what may be done about it. The subject will be approached under the following headings: Prevalence of syphilis in the general population, utilizing the most up-to-date statistical data available; the direct relation of syphilis to industry; illustrations of how syphilis is handled in representative concerns; suggestions for industry in remedying the situation; suggestions as to general community measures; and ways in which the American Social Hygiene Association is prepared to help industry.

Other demonstrations and displays of equal importance are in the process of being assembled.

One exhibit which falls outside the interests of the Industrial Hygiene Section, but which the committee considers so worthwhile as to include, is sponsored by Dr. Henry F. Vaughan, Health Commissioner of Detroit. It deals with a coöperative community public health program, worked out between the local medical society and health department, as a means of increasing the number of persons reached through preventive medicine and health promotion activities by stimulating and making possible an increasingly greater practice of these services by private physicians.

Delegates to the Washington Annual Meeting are urged to inspect this first attempt of one section to interpret its work and aims to other public health specialists. There is much valuable information to be acquired by a study of the exhibits. It is hoped that the effort of the Industrial Hygiene Section will stimulate other groups in the Association to similar activity at meetings in the future.

NEW MEMBERS

The following list includes applicants who have been approved for membership in the A.P.H.A. by the Sub-Committee on Eligibility. These new members have requested affiliation with the sections indicated, and action by the Section Council will follow.

Health Officers Section

Roy W. Benton, M.D., Shorewood, Wis., Health Commissioner

J. D. Brook, M.D., Kent County Health Department, Grand Rapids, Mich., County Health Officer

Oscar M. Craven, M.D., City Hall, Springfield, O., Director of Public Health

Glenn C. Dowell, M.D., Carrollton, O., County Health Officer, Carroll County

William C. Ellet, M.D., Department of Public Health, Benton Harbor, Mich., Director of Public Health

Neil C. Geis, M.D., City Health Department, Casper, Wyo., City Health Officer

Walter S. Holley, M.D., 2047 Calumet St., Toledo, O., Commissioner of Health

Charles F. Nelson, M.D., Health Department, Beverly Hills, Calif., Health Officer

William P. Parker, M.D., Davidson County Health Department, Nashville, Tenn., Assistant Health Officer

H. H. Savage, M.D., City Health Department, Ogden, Utah, City Physician

Lawrence J. Smith, M.D., Department of Health, Warwick, R. I., Commissioner of Health

Harold P. Sullivan, M.D., 4751 Madison St., Chicago, Ill., Director of Health Service, Chicago Fire Department

Dr. Julio Viniegra, Jr., Avenida Morelos 32, Cuernavaca, Morelos, Mex., Director of Health

Public Health Engineering Section

John A. Caraway, Health Department, Union City, Tenn., Sanitary Officer

John B. Gordon, District Building, Washington, D. C., Director of Sanitary Engineering, District of Columbia

Dr. Karl Imhoff, Ruhr Verband 37, Kronprinzen St., Essen, Germany, Sanitary Engineer (Assoc.)

Paul W. Mack, Metropolitan Water District, Manila, P. I., Manager and Chief Engineer

C. H. Mock, Elizabethton, Tenn., Sanitary Inspector

James O. Myers, 906 Bigley Ave., Charleston, W. Va., Inspector, Kanawha County Health Unit

George G. Nasmith, Ph.D., 1130 Bay St., Toronto, Ont., Consulting Engineer
L. R. Stockman, Box 635, Baker, Ore., Sanitary Engineer

Laboratory Section

Henri L. Berard, Ph.D., Provincial Dairy School, St. Hyacinthe, P. Que., Dairy Bacteriologist
Hugh E. Eagan, 1418 15 St., Huntington, W. Va., Milk Inspector
Lucille Watt, Box 268, Tuscaloosa, Ala., Director, Tuscaloosa Branch Laboratory

Industrial Hygiene Section

Katherine A. Rinis, 511 W. 186 St., New York, N. Y., Medical and Industrial Social Service

Food and Nutrition Section

Arthur K. Besley, Ph.D., 20 Monroe Ave., Riverdale, Md., Associate Bacteriologist, Bureau of Animal Industry, U. S. Dept. of Agriculture
Gertrude S. Smith, 2694 University Ave., St. Paul, Minn., Acting Secretary, Twin City Unit, National Dairy Council

Child Hygiene Section

Marietta Catalano, M.D., 115 School St., Buffalo, N. Y., Assistant Medical School Examiner
Pilar H. Lira, M.D., Apartado 679, Mexico, D. F., Mex., Director, Child Hygiene Division, Mexican Rural Health Service
Charles E. McLean, M.D., 443 Sammon Ave., Toronto 6, Ont., Medical Officer of Health, Township of East York

Public Health Education Section

Lillian B. Davis, Sc.D., 1245 N. Broadway, Baltimore, Md., Supervisor of Health Education, Department of Education
Florence J. Fiske, 440 S. Burdick St., Kalamazoo, Mich., Executive Secretary, Kalamazoo County Tuberculosis Assn.
John H. Graves, M.D., 977 Valencia St., San Francisco, Calif., President, State Bd. of Health
Helen M. Hackett, R.N., 26 Lynde St., Boston, Mass., Consultant in Public Health Nursing, Dept. of Public Health
J. B. Hock, R.N., 3612 North 17 St., Philadelphia, Pa. (Assoc.)
Thomas T. McKinney, M.D., 2401 Emerson St., Denver, Colo., Medical Director, American Woodmen Society
Alexander E. Nash, 140 W. Medical Bldg., Ann Arbor, Mich., Student (Assoc.)

Public Health Nursing Section

Ruth W. Hubbard, 1340 Lombard St., Philadelphia, Pa., Director, Visiting Nurse Society
Margaret L. Jackson, 1409 Pennock Ave., Nashville, Tenn., Field Nurse, Davidson County Health Dept.
Jane N. Laib, 3523 Wabash Ave., Baltimore, Md., Director, Bureau of Nursing, Health Dept.
Mildred May, R.N., State Health Department, Nashville, Tenn., Public Health Nurse
Caroline F. Reitz, R.N., R.D. No. 3, Brookville, Pa., Public School Nurse

Epidemiology Section

Rulx Leon, M.D., National Public Health Service, Port-au-Prince, Haiti, Director General
Ralph E. Wheeler, M.D., U. S. Public Health Service, Ellicottville, N. Y., Epidemiologist

DECEASED MEMBERS

C. Hampson Jones, M.D., Baltimore, Md., Elected Member 1915, Fellow 1922
Howard H. Bell, M.D., St. Louis, Mo., Elected Member 1928
George H. Fox, M.D., Binghamton, N. Y., Elected Member 1920
Walter T. Fuller, M.D., Dorchester, Mass., Elected Member 1920
Edwin E. Hubbard, M.D., Dearborn, Mich., Elected Member 1929
Arthur Kendrick, Brighton, Mass., Elected Member 1912
Alma Taylor, R.N., Norwood, Mass., Elected Member 1921

ADDITIONAL APPLICANTS FOR FELLOWSHIP *

HEALTH OFFICERS' SECTION—A. N. Crain, M.D., Phoenix, Ariz., William E. Donahoe, M.D., Sioux Falls, S. D., Peel M. Payne, M.D., Napoleonville, La.

CHILD HYGIENE SECTION—Esther L. Richards, M.D., Baltimore, Md., Harold C. Stuart, M.D., Boston, Mass., Dorothy Worthington, M.D., White Plains, N. Y.

PUBLIC HEALTH EDUCATION SECTION—Melvin P. Isaminger, D.P.H., Corvallis, Ore.

PUBLIC HEALTH NURSING SECTION—Mary J. Dunn, B.S., Nashville, Tenn.

EPIDEMIOLOGY SECTION—Lee S. Huizenga, M.D., Jukao, Kiangsu, China.

* See August JOURNAL, p. 847.

NEW OFFICERS OF WESTERN BRANCH A.P.H.A.

DR. A. L. BEAGHLER was elected President of the Western Branch A.P.H.A. at the June meeting. He has been active in the affairs of the Western Branch for the past several years, and has been Vice-President for the past year. Dr. Beaghler has been Director of Health Service for the Denver Public Schools since 1921, where he became nationally known in the field of school health work.

Dr. J. L. Pomeroy, Health Officer of Los Angeles County, became President-Elect.

Other officers elected were: *Vice-Presidents*—A. N. Crain, M.D., of Phoenix, Ariz.; Mrs. Saidie Orr-Dunbar, of Portland, Ore.; John J. Sippy, M.D., of Stockton, Calif. *Secretary*—W. P. Shepard, M.D., of San Francisco, Calif. *Treasurer*—W. F. Higby, of San Francisco, Calif.

CONSTITUTIONAL CHANGES, WESTERN BRANCH

CERTAIN amendments have been made in the Constitution and By-Laws of the Western Branch. The following gives the present reading of the altered sections:

Article IV (Constitution)

Officers

The officers of the Western Branch, American Public Health Association, shall be Fellows of the Western Branch, American Public Health Association, and shall consist of a President, President-Elect, three Vice Presidents, a Secretary, and a Treasurer. The officers shall be elected by written ballot of the Active Members and Fellows present and voting at Annual Meeting as provided for in this article and in the By-Laws. The President-Elect shall serve as such from the close of the Annual Meeting at which he was elected to the close of the next Annual Meeting when he shall automatically become President. As President he shall serve to the close of the next succeeding Annual Meeting. Officers shall serve from the close of the Annual Meeting when elected until the close of the next Annual Meeting; and all officers shall serve in any case until their successors are elected and qualified. A majority vote of those voting shall be required to elect, and if no candidate receives a majority vote on the first ballot, the candidate receiving the smallest number of votes shall be dropped after each ballot in succession until a majority vote is obtained.

Article III (By-Laws)

(addition)

9. To appoint each year a representative on the Governing Council of the American Public Health Association, in accordance with Article III, Paragraph A, Item 6, of the Constitution of the American Public Health Association.

PRELIMINARY PROGRAM OF THE SIXTY-FIRST ANNUAL MEETING

AMERICAN PUBLIC HEALTH ASSOCIATION

Washington, D. C., October 24–27, 1932

THE Annual Meeting Program Committee presents the preliminary program of the scientific sessions of the Sixty-first Annual Meeting of the American Public Health Association and information concerning meetings of related organizations.

Scientific trips are listed on page 944. The next issue of the JOURNAL will give details regarding entertainment.

The complete program of the Institute on Health Education to be held October 22, 23, and 24, will be found on pages 971–972.

Since the following program cannot be considered definite in every respect now, delegates are urged to consult the Final Program, available at the Registration Desk in the Willard Hotel at the time of the meeting. All meetings, unless otherwise stated, will be held in the Willard Hotel.

Monday, 9:30 A.M.

HEALTH OFFICERS

First Session—Small Ball Room

Housing of Health Departments (Report of the Committee on Business Management). I. F. THOMPSON, M.D., Commissioner of Health, Racine, Wis.

Discussion. ROBERT H. RILEY, M.D., State Commissioner of Health, Baltimore, Md., and JOHN P. KOEHLER, M.D., Commissioner of Health, Milwaukee, Wis.

Vital Statistics and the Health Officer. GEORGE B. L. ARNER, PH.D., Columbia University, New York, N. Y.

Discussion. SHIRLEY W. WYNNE, M.D., Commissioner of Health, New York, N. Y.

Heart Disease and Public Health. ALFRED E. COHN, M.D., The Hospital of the Rockefeller Institute for Medical Research, New York, N. Y.

Discussion. CHARLES F. WILINSKY, M.D., Deputy Commissioner, Child Hygiene Division, Department of Health, Boston. Mass.

Getting Good Spirit in a Health Department Staff. E. T. HANLEY, M.D., Seattle, Wash.

VITAL STATISTICS

First Session—Gridiron Room

Report of the Committee on Registration Affairs. *Chairman,* T. F. MURPHY, M.D., Chief Statistician for Vital Statistics, Bureau of the Census, Washington, D. C.

Monday, 9:30 A.M.

VITAL STATISTICS (Cont.)

First Session—Gridiron Room

The County Health Officer and Vital Statistics. F. M. REGISTER, M.D., Director of Public Health, Goldsboro and Wayne County, Goldsboro, N. C.

Precaution When Filing Deferred Certificates. STEWART G. THOMPSON, D.P.H., Director, Division of Vital Statistics, State Board of Health, Jacksonville, Fla.

The Occurrence, Physical Signs, and Significance of Pulmonic Systolic Murmurs in Adolescent Boys. JEROME MEYERS, M.D., Department of Health, New York, N. Y.

A Study of Resident Tuberculosis Mortality in New York State. ELIZABETH PARKHURST, Senior Statistician, Division of Vital Statistics, State Department of Health, Albany, N. Y.

Report of the Committee on Forms and Methods of Statistical Practice. *Chairman*, A. W. HEDRICH, Sc.D., Associate in Biostatistics, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.

INDUSTRIAL HYGIENE

First Session—Cabinet Room

The Possibilities of Industrial Medical Service. C.-E. A. WINSLOW, DR.P.H., *Chairman*, Industrial Hygiene Section, Yale University, New Haven, Conn.

Lead Poisoning Legislation. FREDERICK L. HOFFMAN, LL.D., Prudential Insurance Company of America, Newark, N. J.
Discussion. SIR THOMAS OLIVER, Newcastle upon Tyne, England.

Studies in Lead Excretion. ROBERT KEHOE, M.D., College of Medicine, Cincinnati, O.

Prevention of Lead Poisoning in Industry. GEORGE H. GEHRMANN, M.D., Wilmington, Del.

The Relative Susceptibility of Men and Women to Occupational Diseases. CAREY P. MCCORD, M.D., Health Conservancy Laboratories, Cincinnati, O.

CHILD HYGIENE

First Session—Large Ball Room

Research Session

Social and Economic Factors Influencing the Use of Preventive Medical Service for Preschool Children. MAHEW DERRYBERRY, Research Assistant, Committee on Medical Care for Children, White House Conference on Child Health and Protection, New York, N. Y.

A Suggested Method of Computing and Standardizing the Maternal Mortality Rate. ROBERT J. LOWRIE, M.D., Adjunct Attending Obstetrician, Manhattan Maternity Hospital Dispensary, New York, N. Y.

Sleep Patterns of Children. SAMUEL RENSHAW, PH.D., Associate Professor, Experimental Psychology, College of Education, Ohio State University, Columbus, O.

Monday, 9:30 A.M.

CHILD HYGIENE (Cont.)

First Session—Large Ball Room

Some **Outcomes from a Study of the Effects of School Health Programs on Children.** RAYMOND FRANZEN, PH.D., Research Director, School Health Study, American Child Health Association, New York, N. Y.

Monday, 12:15 P.M.

PUBLIC HEALTH EDUCATION

Luncheon Session—Fairfax Room

HEALTH BULLETINS

Presiding: BERTRAND BROWN, Director, Division of Publications, Milbank Memorial Fund, New York, N. Y.

What **Health Departments Do About Health Education.** JOHN HALL, American Public Health Association, New York, N. Y.

PUBLIC HEALTH NURSING

Luncheon Session—Rose Room, Washington Hotel

Monday, 2:30 P.M.

FOOD AND NUTRITION

First Session—Cabinet Room

Preservatives in Fruit Products. H. M. LANCASTER, Chief Dominion Analyst, Department of Pensions and National Health, Ottawa, Ont.

Dehydration of Foods. PROFESSOR SAMUEL C. PRESCOTT, Department of Biology and Public Health, Massachusetts Institute of Technology, Cambridge, Mass.

Health Value of Fruit Juice Beverages. WALTER H. EDDY, PH.D., Teachers College, Columbia University, New York, N. Y.

Nutritive Value of Cranberries. CARL R. FELLERS, PH.D., Massachusetts State College, Amherst, Mass.

Report of the Committee on Cereals and Their Products. *Chairman,* F. C. BLANCK, PH.D., U. S. Bureau of Chemistry and Soils, Washington, D. C.

Report of the Committee on Nutritional Problems. *Chairman,* PROFESSOR HENRY C. SHERMAN, Department of Chemistry, Columbia University, New York, N. Y.

The Bacterial Content of Frosted Hamburg Steak. LAWRENCE P. GEER, and ERNEST SMITH, Birdseye Laboratories, Gloucester, Mass.

A New Syndrome Produced by Oxidizing Fat in the Diet. DOROTHY V. WHIPPLE, M.D., Pediatric Department, University of Pennsylvania, Philadelphia, Pa.

Monday, 2:30 P.M.

PUBLIC HEALTH NURSING

First Session—Rose Room, Washington Hotel

(Continuation of Luncheon Session)

Childhood Tuberculosis. EUGENE L. OPIE, M.D., The Henry Phipps Institute, Philadelphia, Pa.

Discussion:

Health Officer. R. M. ATWATER, M.D., DR.P.H., Commissioner of Health, Cattaraugus County Health Department, Olean, N. Y.

School Physician. L. W. CHILDS, M.D., Supervisor, Health Service, Bureau of Physical Welfare, Board of Education, Cleveland, O.

Public Health Nurse. VIOLET HODGSON, R.N., Assistant Director, National Organization for Public Health Nursing, New York, N. Y.

General Discussion.

EPIDEMIOLOGY

First Session—Sun Room, Washington Hotel

Epidemiological Methods in the Control of Syphilis and Gonorrhea. WILLIAM MUNSON, M.D., State Department of Health, Albany, N. Y.

Typhus-Spotted Fever in Maryland. ROBERT H. RILEY, M.D., State Health Officer, and C. N. HALLIDAY, M.D., State Department of Health, Baltimore, Md.

The Epidemiology of the Typhus-Spotted Fever Group in the Eastern Part of the United States. A. RUMREICH, M.D., P. A. Surgeon, U. S. Public Health Service, Washington, D. C.

The Neutralization of Poliomyelitis Virus by the Serum of Liberian Negroes. N. PAUL HUDSON, M.D., and EDWIN H. LENNETTE, Department of Hygiene and Bacteriology, University of Chicago, Chicago, Ill.

The Epidemiology of Complications of Smallpox Vaccination. CHARLES E. ARMSTRONG, M.D., Surgeon, U. S. Public Health Service, Washington, D. C.

An Analysis of New York State Typhoid Carrier Control. HERMAN F. SENFTNER, M.D., DR.P.H., and FRANK E. COUGHLIN, M.D., DR.P.H., State Department of Health, Albany, N. Y.

PUBLIC HEALTH EDUCATION

First Session—Large Ball Room

HEALTH MOTIVATION

What to Believe. R. M. ATWATER, M.D., DR.P.H., Commissioner of Health, Cattaraugus County Health Department, Olean, N. Y.

Principles of Motivation. BENJAMIN C. GRUENBERG, New York, N. Y., and E. S. ROBINSON, M.D., PH.D., Professor of Psychology, Institute of Human Relations, Yale University, New Haven, Conn.

Monday, 2:30 P.M.

LABORATORY

Session 1A—Medical Sub-Session—Fairfax Room*

Presiding: ANNA W. WILLIAMS, M.D., *Vice-Chairman,* Laboratory Section.

Section Business (In Session 1B*).

A Study of **Lobar Pneumonia in Massachusetts: Methods and Results of Pneumococcus Type Determination, 1931–1932.** RODERICK HEFFRON, M.D., and FLORENCE M. VARLEY, Pneumonia Study and Service, Department of Public Health, Boston, Mass.

A Test for **Reaction-Producing Substances in Concentrated Antipneumococcic Serum.** L. A. BARNES, PH.D., Antitoxin and Vaccine Laboratory, State Department of Public Health, Boston, Mass.

A Test for the **Value of Antipneumococcus Serum in Rabbits.** KENNETH GOODNER, PH.D., The Hospital of the Rockefeller Institute for Medical Research, New York, N. Y.

An **Experimental and Clinical Comparison Between Convalescent Serum and Non-Convalescent Serum in Poliomyelitis.** MAURICE BRODIE, M.D., Department of Bacteriology, McGill University, Montreal, Que.

Properties of **Blood Serums Reactivating Completely Neutralized Meningococcus Toxic Substances.** GREGORY SHWARTZMAN, M.D., Laboratories of the Mount Sinai Hospital, New York, N. Y.

The **Shwartzman Phenomenon: Factors Complicating Its Use in Testing Antimeningococcic Serums.** ANNA M. PABST and SARA E. BRANHAM, PH.D., National Institute of Health, Washington, D. C.

Titration of the **Neutralizing Potency of Antimeningococcus Serum by the Phenomenon of Local Skin Reactivity.** GRACE SICKLES, Division of Laboratories and Research, State Department of Health, Albany, N. Y.

LABORATORY

Session 1B—Sanitation Sub-Session—Gridiron Room*

SYMPOSIUM ON STANDARD METHODS

Presiding: M. H. MCCRADY, *Chairman,* Laboratory Section.

Section Business.

Some **Proposed Procedures for the Presumptive Test in the Determination of the Coli-Aerogenes Group in Water.** C. T. BUTTERFIELD, U. S. Public Health Service, Cincinnati, O.

Standardization of the Wassermann Test and Allied Procedures. RUTH GILBERT, M.D., Division of Laboratories and Research, State Department of Health, Albany, N. Y.

Report of the Committee on Standard Methods. *Chairman,* R. G. PERKINS, M.D., Wakefield, R. I.

Shellfish Analysis and the Problems Involved. FREDERICK P. GORHAM, Brown University, Providence, R. I.

* Session 1A—Medical Sub-Session in Fairfax Room, and Session 1B—Sanitation Sub-Session in Gridiron Room, meeting concurrently.

Monday, 2:30 P.M.

LABORATORY (Cont.)

*Session 1B *—Sanitation Sub-Section—Gridiron Room*

Standardization of Diagnostic Procedures and Reagents:

The Bacteriology of the Intestinal Pathogens. LEON C. HAVENS, M.D., State Department of Health, Montgomery, Ala.

Agglutination in the Diagnosis of Enteric Disease. RUTH GILBERT, M.D., and MARIAN B. COLEMAN, Division of Laboratories and Research, State Department of Health, Albany, N. Y.

Standardization of Diagnostic Reagents. JOHN F. NORTON, PH.D., Department of Health, Detroit, Mich.

Discussion.

Open Forum on Bacteriological Methods for Milk Analysis. ROBERT S. BREED, PH.D., New York State Agricultural Experiment Station, Geneva, N. Y.

Discussion opened by N. J. HOHL, Bureau of Milk Sanitation, State Department of Health, Albany, N. Y.

* Session 1A—Medical Sub-Session meeting concurrently in Fairfax Room.

PUBLIC HEALTH ENGINEERING SECTION AND CONFERENCE OF STATE SANITARY ENGINEERS

Joint Session—Small Ball Room

Report of the Joint Committee on Rural Sanitation. *Chairman,* H. B. HOMMON, Sanitary Engineer, U. S. Public Health Service, San Francisco, Calif.

Sanitation of Bathing Places (Report of the Joint Committee on Swimming Pools and Bathing Places). *Chairman,* W. J. SCOTT, Director, Bureau of Sanitary Engineering, State Department of Health, Hartford, Conn.

High Temperature—Short Time Pasteurization (Combined Report from Conference Committee on Milk Sanitation and Section Committee on Milk Supply). *Chairman,* C. A. HOLMQUIST, Director, Division of Sanitation, State Department of Health, Albany, N. Y.

Chemistry of Chlorination. DR. FRANZ C. SCHMELKES, Assistant Director of Research, Wallace and Tiernan Company, Newark, N. J.

Monday, 6:30 P.M.

PUBLIC HEALTH EDUCATION

Dinner Session—Fairfax Room

Closed session—for Fellows and members of the Section only.

Section Business.

Monday, 8:00 P.M.

FIRST GENERAL SESSION

Large Ball Room

Invocation. RIGHT REVEREND JAMES E. FREEMAN, Bishop of Washington.

Addresses of Welcome.
WILLIAM C. FOWLER, M.D., Health Officer of the District of Columbia, and Chairman of the Local Committee.
RAY LYMAN WILBUR, M.D., Secretary of the Interior.
DR. LUTHER H. REICHELDERFER, President, Board of Commissioners, District of Columbia.

Address of the President of the American Public Health Association. LOUIS I. DUBLIN, PH.D., Third Vice President and Statistician, Metropolitan Life Insurance Company, New York, N. Y.

Reception and Dancing.

Tuesday, 9:30 A.M.

LABORATORY

Session 2A*—Medical Sub-Session—Fairfax Room

Presiding: ANNA W. WILLIAMS, M.D., *Vice Chairman,* Laboratory Section.

Laboratory Diagnosis of Tuberculosis Using Vitamin Deficient Animals. JAMES STEVENS SIMMONS, M.D., Department of Bacteriology, U. S. Army Medical School, Washington, D. C.

Study of Rocky Mountain Fever (Eastern Type) in Tennessee. WILLIAM LITTERER, M.D., Division of Laboratories, State Department of Public Health, Nashville, Tenn.

The Laboratory Diagnosis of Typhus Fever and Spotted Fever. L. F. BADGER, M.D., National Institute of Health, Washington, D. C.

A Bacteriological Study of Dysentery in Henrico County, Va. G. FOARD MCGINNES, M.D., A. L. MACLEAN, M.D., and FORREST SPINDLE, State and County Departments of Health, Richmond, Va.

Laboratory Diagnosis of Relapsing Fever and of Rat Bite Fever. EDWARD FRANCIS, M.D., National Institute of Health, Washington, D. C.

Laboratory Aids in the Diagnosis and Serum Therapy of Pneumococcus Pneumonia. ALBERT B. SABIN, M.D., Department of Bacteriology and Immunology, New York University and Bellevue Hospital Medical College, New York, N. Y.

Rheumatic Diseases and Sore Throat with Reference to Hemolytic Streptococci. I. PILOT, M.D., and D. J. DAVIS, M.D., College of Medicine, University of Illinois, Chicago, Ill.

The Adjustment of the Hydrogen Ion Concentration of Loeffler's Medium for the Diagnosis of Diphtheria. C. A. STUART, PH.D., FREDERICK P. GORHAM, and R. M. PIKE, Biological Laboratory, Brown University, Providence, R. I.

Value of Culture Tests in the Diagnosis of Diphtheria. H. M. HATFIELD, M.D., and A. G. MANN, Bureau of Laboratories, Department of Health, New York, N. Y.

* Session 2B—Sanitation Sub-Session meeting concurrently in T-Room, Washington Hotel.

Tuesday, 9:30 A.M.

LABORATORY

*Session 2B *—Sanitation Sub-Session—T-Room, Washington Hotel*

Presiding: M. H. McCRADY, *Chairman,* Laboratory Section.

The Relation of the Actinic Intensity of Sunshine to Minimal Wave Length. GERALD L. HOEFT, and FRANCES DEYOUNG, Bureau of Laboratories and Research, Department of Health, Chicago, Ill.

Certain Relationships of Leucocytes and Streptococci to Mastitis. G. J. HUCKER, PH.D., New York State Agricultural Experiment Station, Geneva, N. Y.

Bacteriological Milk Analysis: New York State's Supplement to "Standard Methods." F. L. SCHACHT, PH.D., and A. H. ROBERTSON, PH.D., State Department of Agriculture and Markets, Albany, N. Y.

Standard Methods of Examining Powdered Milk and Its Allied Products. P. S. PRICKETT, PH.D., Mead Johnson & Company, Evansville, Ind.

A Study of Bacteriological Methods of Testing and Means of Disinfecting Water with Chlorine, with Particular Reference to Swimming Pool Water. W. L. MALLMANN, Department of Bacteriology, Engineering Experiment Station, Michigan State College, East Lansing, Mich., and WILLIAM H. CARY, JR., Department of Health, Detroit, Mich.

The Treatment of Water by Colloidal Silver, Silver Nitrate, and Certain Silvered Materials. JAMES GIBBARD, Laboratory of Hygiene, Department of Pensions and National Health, Ottawa, Ont.

Present Status of Handling Water Samples and Comparison of Bacteriological Analyses Under Varying Temperature and Holding Conditions with Special Reference to the Direct Method. ELFREDA L. CALDWELL and LELAND W. PARR, PH.D., Field Research Laboratory, State Department of Health, Andalusia, Ala.

* Session 2A—Medical Sub-Session meeting concurrently in Fairfax Room

PUBLIC HEALTH ENGINEERING AND INDUSTRIAL HYGIENE SECTIONS

Joint Session—Small Ball Room

SYMPOSIUM ON AIR HYGIENE

Sunlight and Health. HAVEN EMERSON, M.D., Department of Public Health Administration, Columbia University, New York, N. Y.

Loss of Actinic Sunshine as a Health Problem of Cities. FRED O. TONNEY, M.D., Assistant Commissioner in Charge of Research, Department of Health, Chicago, Ill.

On the Bacterial Behavior of Air. W. F. WELLS, Harvard Engineering School, Cambridge, Mass.

Air Conditioning with Relation to Comfort, Health and Efficiency. EMERY R. HAYHURST, M.D., PH.D., Consulting Industrial Hygienist, Columbus, O.

The Scientific Basis of Ventilation Standards. LEONARD GREENBURG, M.D., PH.D., Yale University, New Haven, Conn.

Tuesday, 9:30 A.M.

CHILD HYGIENE AND PUBLIC HEALTH NURSING SECTIONS AND AMERICAN ASSOCIATION OF SCHOOL PHYSICIANS

Joint Session—Large Ball Room, Gridiron Room, and Cabinet Room

Presiding: WILLIAM A. HOWE, M.D., State Medical Inspector of Schools, and Secretary, American Association of School Physicians, Albany, N. Y.

Round Table Discussions

Three Separate Subjects Each in a Room

Relative **Merits of Three School Dental Programs as Outlined by Dr. Alfred Walker at the Montreal Meeting of the American Public Health Association.** *Group Leader.* GEORGE H. WANDEL, D.D.S., Supervisor, Bureau of Public Relations, American Dental Association, Chicago, Ill.

The **Functions of the School Physician, Nurse, Teacher, and Principal in a School Health Program.** *Group Leader.* HARRIET FULMER, R.N., Supervisor, Rural Nurses, Cook County, Chicago, Ill.

Community **Responsibility for Medical Service to Infants and Preschool Children.** *Group Leader.* DONALD B. ARMSTRONG, M.D., Third Vice President, Metropolitan Life Insurance Company, New York, N. Y.

General Summary in Large Ball Room.

PUBLIC HEALTH EDUCATION

Second Session—Rose Room, Washington Hotel

CLINIC ON PRINTED MATTER

Clinician—H. E. KLEINSCHMIDT, M.D., Director, Health Education, National Tuberculosis Association, New York, N. Y., assisted by RAYMOND S. PATTERSON, PH.D., Life Conservation Service, John Hancock Mutual Life Insurance Company, Boston, Mass.

Tuesday, 12:15 P.M.

INDUSTRIAL HYGIENE

Luncheon Session—Fairfax Room

Address. SIR THOMAS OLIVER, Newcastle upon Tyne, England

Reports of Committees.

Rehabilitation of the Industrial Disabled (*Motion Picture*).

CHILD HYGIENE

Luncheon Session—Small Ball Room

Tuesday, 2:30 P.M.

VITAL STATISTICS

Second Session—Gridiron Room

Section Business.

Report of the Committee on Registration of Births of Illegitimate and Adopted Children. *Chairman*, SHELDON L. HOWARD, State Registrar, State Department of Health, Springfield, Ill.

Public Health in Porto Rico. MANUEL A. PEREZ, Chief, Bureau of Vital Statistics, Department of Health, San Juan, P. R.

The Vital Statistics of the United States 1900-1930: A Preliminary Study. WALTER F. WILLCOX, PH.D., Professor of Economics and Statistics, Cornell University, Ithaca, N. Y.

A Study of Mortality by Census Tracts in Cincinnati. FLOYD P. ALLEN, M.D., Associate Secretary, Public Health Federation, Cincinnati, O.

A Code for Indexing Statistical Tables. A. W. HEDRICH, SC.D., Associate in Biostatistics, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.

Seasonal Distribution of Whooping Cough for Periods of High and Low Incidence. GAIUS E. HARMON, M.D., Department of Hygiene and Bacteriology, School of Medicine, Western Reserve University, Cleveland, O.

EPIDEMIOLOGY

Second Session—Fairfax Room

A Study of 1300 Deaths from Measles. E. S. GODFREY, JR., M.D., Director, Division of Communicable Diseases, State Department of Health, Albany, N. Y.

Epidemic Influenza: A Comparison of Symptomatology as Observed in a Major and in a Minor Epidemic. J. A. DOULL, M.D., and ANNA BAHLKE, Department of Hygiene and Bacteriology, Western Reserve University, Cleveland, O.

Diphtheria Studies in Detroit. HENRY F. VAUGHAN, D.P.H., Commissioner of Health, and DON W. GUDAKUNST, M.D., Department of Health, Detroit, Mich.

The Risk of Persons in Familial Contact with Pulmonary Tuberculosis. W. H. FROST, M.D., School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.

The Results of a Survey of Trachoma Incidence in Tennessee and the Program of Accomplishment to Date. P. E. FAED, M.D., Trachoma Field Technician, State Department of Health, Nashville, Tenn., and C. E. RICE, M.D., P. A. Surgeon, Trachoma Prevention, U. S. Public Health Service, Rolla, Mo.

MENTAL HYGIENE

Special Session—Large Ball Room

Presiding: CHARLES F. WILINSKY, M.D., Deputy Commissioner, Child Hygiene Division, Department of Health, Boston, Mass.

Mental Health of the Preschool Child. IRA S. WILE, M.D., Assistant Pediatrician, Mount Sinai Hospital, New York, N. Y.

Mental Health of the School Child. ESTHER RICHARDS, M.D., Associate Professor of Psychiatry, Johns Hopkins Hospital, Baltimore, Md.

Tuesday, 2:30 P.M.

MENTAL HYGIENE (Cont.)

Special Session—Large Ball Room

Mental **Health of the Adolescent.** WILLIAM A. WHITE, M.D., President, Institute of Mental Hygiene, Washington, D. C.

Summarization. CLARENCE M. HINCKS, M.D., General Director, National Committee for Mental Hygiene, New York, N. Y.

The Aim and **Accomplishments of a Health Center Mental Hygiene Program.** ELIZABETH ADAMSON, M.D., Psychiatrist, Bellevue-Yorkville Health Demonstration, New York, N. Y.

PUBLIC HEALTH ENGINEERING

First Session—Small Ball Room

Section Business.

Report of the **Committee on Fellowship and Membership.** *Chairman,* LINN H. ENSLOW, Editor, *Water Works and Sewerage,* New York, N. Y.

Report of the **Committee on Public Health Engineering Manual.** *Chairman,* ARTHUR E. GORMAN, Engineer of Filtration, Department of Public Works, Chicago, Ill.

SYMPOSIUM ON AIR HYGIENE (Continued)

The Effects of **Air Contaminants on the Natural Light of Cities.** H. B. MELLER, Head, and MARY E. WARGA, Industrial Fellow, Air Pollution Investigation, Mellon Institute of Industrial Research, Pittsburgh, Pa.

Aerial **Nuisances from the Refining and Burning of Petroleum Oils as a Public Health Problem.** STEPHEN DEM. GAGE, Consulting Engineer, Providence, R. I.

Discussion. EDWARD WRIGHT, Sanitary Engineer, State Department of Health, Boston, Mass.

Smoke **Abatement at Low Cost.** MORRIS M. COHN, Sanitary Engineer, Department of Public Works, Schenectady, N. Y.

Noise and Its Relation to Health. EDWARD F. BROWN, Director, Noise Abatement Commission, New York, N. Y.

Progress Report of the **Committee on Noise.** *Chairman,* C. R. COX, Assistant Sanitarian, State Department of Health, Albany, N. Y. (To be presented by title only.)

FOOD AND NUTRITION

Second Session—Cabinet Room

Report of the **Committee on Fish and Shell Fish.** *Chairman,* ALBERT C. HUNTER, PH.D., U. S. Food and Drug Administration, Washington, D. C.

The **Vitamin Content of the Water Soluble Portion of Milk.** R. C. BENDER, PH.D., and GEORGE C. SUPPLEE, PH.D., Research Laboratories, The Dry Milk Company, Bainbridge, N. Y.

Fumigation of Foodstuffs: Public Health Aspects of an Increasing Commercial Practice. C. L. WILLIAMS, M.D., Senior Surgeon, U. S. Public Health Service, Washington, D. C.

Metals and Their Relation to Public Health. C. N. MYERS, M.D., and DINFORD THRONE, M.D., New York Skin and Cancer Hospital, New York, N. Y.

Tuesday, 2:30 P.M.

FOOD AND NUTRITION (Cont.)

Second Session—Cabinet Room

Health Hazards Involved in the Spraying of Fruits and Vegetables. FREDERICK B. FLINN, PH.D., Associate Professor of Physiology, Columbia University, New York, N. Y.

Report of the Committee on Meat and Meat Products. *Chairman,* PAUL E. HOWE, PH.D., U. S. Bureau of Animal Industry, Washington, D. C.

Comparative Nutritional Values of Oysters and Beef Liver and Other Dietary Supplements in Certain Dietary Deficiency States in Chickens. H. D. PEASE, M.D., Pease Laboratories, New York, N. Y.

Nutrition and the Present Economic Situation. DR. LYDIA J. ROBERTS, Chairman, Department of Home Economics and Household Administration, University of Chicago, Chicago, Ill.

Tuesday, 6:30 P.M.

PUBLIC HEALTH ENGINEERING

Joint Dinner—Small Ball Room

Public Health Engineering Section and Conference of State Sanitary Engineers. Annual Engineers' Stag Dinner Party.

TRAINING AND PERSONNEL

Dinner Session—Fairfax Room

Presiding: CLAIR E. TURNER, DR.P.H., *Chairman,* Committee on Training and Personnel, Massachusetts Institute of Technology, Cambridge, Mass.

The Current Work of the Committee. CLAIR E. TURNER, DR.P.H.

Possible Coöperation with the National Board of Medical Examiners. W. S. LEATHERS, M.D., President, National Board of Medical Examiners, School of Medicine, Vanderbilt University, Nashville, Tenn.

The Public Health Nursing Profession. LILLIAN A. HUDSON, R.N., Department of Nursing Education, Teachers College, Columbia University, New York, N. Y.

Professionalizing Public Health. E. L. BISHOP, M.D., State Health Commissioner, Nashville, Tenn.

Tuesday, 8:00 P.M.

MAINTAINING HEALTH EFFICIENCY IN TIMES OF DISTRESS

Special Session—Large Ball Room

A session devoted to a description of problems precipitated on health departments throughout the United States by the increased responsibilities and the reduced appropriations of a depression period, and how those problems have been met. No formal addresses. General discussion invited.

Presiding: LOUIS I. DUBLIN, PH.D., President, American Public Health Association, New York, N. Y.

Wednesday, 9:30 A.M.

LABORATORY

Session 3—Medical Sub-Session—Fairfax Room*

Presiding: M. H. McCRADY, *Chairman,* Laboratory Section.

The Clinical **Value of the Presumptive Kahn Test.** TOMAS CAJIGAS, M.D., Clinical Pathological Laboratory, Washington, D. C.

Choosing a **Serum Test for Syphilis.** WILLIAM A. HINTON, M.D., Department of Clinical Research, Boston Dispensary and Wassermann Laboratory, State Department of Public Health, Boston, Mass.

The Serology of **Syphilis from the Standpoint of the Public Health Laboratory with Special Reference to Precipitation Methods.** JOHN A. KOLMER, M.D., DR.P.H., Department of Pathology and Bacteriology, Research Institute of Cutaneous Medicine, Temple University, Philadelphia, Pa.

Recent **Trends in Practical Luetic Serology and Their Relation to the Public Health Laboratory.** B. S. LEVINE, PH.D., Laboratory of Public Health Institute, Chicago, Ill. (To be presented by title only.)

Some **Observations on the Quantitative Kahn in the Various Stages of Syphilis.** JOHN M. MCCANTS, M.D., Lieutenant Commander, Medical Corps, United States Navy, Norfolk Naval Hospital, Portsmouth, Va.

The **Agglutination Reaction in the Identification of Certain Pathogenic Funguses.** W. D. STOVALL, M.D., and ANNA BUBOLZ, State Laboratory of Hygiene, Madison, Wis.

Yeast-like **Funguses Found on the Skin and in the Intestines of Normal Individuals: A Survey of One Hundred Persons.** RHODA W. BENHAM, PH.D., Mycologist, Laboratory for Medical Mycology, College of Physicians and Surgeons, Columbia University, New York, N. Y.

Necrobacillosis—A Clinical Entity. FREDERICK W. SHAW, M.D., Department of Bacteriology and Clinical Pathology, Medical College of Virginia, Richmond, Va.

The **Effectiveness of Fungicides Upon Two Pathogenic Funguses.** CHESTER W. EMMONS, PH.D., Laboratory for Medical Mycology, College of Physicians and Surgeons, Columbia University, New York, N. Y.

LABORATORY AND EPIDEMIOLOGY SECTIONS *

Joint Session—Large Ball Room

SYMPOSIUM ON INCIDENCE, IDENTIFICATION AND SIGNIFICANCE OF BACTERIAL CARRIERS

Presiding: HAVEN EMERSON, M.D., *Chairman,* Epidemiology Section, and ANNA W. WILLIAMS, M.D., *Vice Chairman,* Laboratory Section.

An Epidemiological Study of Diarrhea and Dysentery in Henrico County, Va. G. FOARD MCGINNES, M.D., A. L. MCLEAN, M.D., and FORREST SPINDLE, State and County Departments of Health, Richmond, Va.

Hemolytic Streptococcus Antigens from Throats of Normal People Compared with Those from Beginning Pneumonias and Terminal Septicemias. ANNA W. WILLIAMS, M.D., C. T. GURLEY, B. KULCHIN and N. STRYON, Bureau of Laboratories, Department of Health, New York, N. Y.

* Session 3—Medical Sub-Session, Laboratory Section, in Fairfax Room, and Joint Session of Laboratory and Epidemiology Sections in Large Ball Room, meeting concurrently.

Wednesday, 9:30 A.M.

LABORATORY AND EPIDEMIOLOGY SECTIONS (Cont.)*

Joint Session—Large Ball Room

Epidemiological Significance of a Given Health Carrier Rate. LLOYD AYCOCK, M.D., Department of Epidemiology, Harvard School of Public Health, Boston, Mass.

Carriers in Whooping Cough. TRAVIS P. BURROUGHS. M.D., Director, Bureau of Communicable Diseases, and EDMUND K. KLINE, D.P.H., Director of Laboratories, Cattaraugus County Department of Health, Olean, N. Y.

Demonstration of Tubercle Bacilli in the Sputum, Feces, and Stomach Lavage of Suspected Tuberculous Children. LUCY MISHULOW, Bureau of Laboratories, Department of Health, CAMILLE KERESZTURI, M.D., New York University Medical College, and DAVID HAUPTMAN, M.D., Department of Pediatrics, Sea View Hospital, New York, N. Y.

Discussion. WILLIAM H. PARK, M.D., Bureau of Laboratories, Department of Health, and BELA SCHICK, M.D., Pediatrician, Mount Sinai Hospital, New York, N. Y.

Serological Diagnosis of Typhoid Carriers. JOHN WYLLIE, D.P.H., Department of Preventive Medicine, Queen's University, Kingston, Ont.

A Study of Typhoid Carriers. LLOYD ARNOLD, M.D., Department of Bacteriology, University of Illinois, Chicago, Ill.

* Session 3—Medical Sub-Session, Laboratory Section, meeting concurrently in Fairfax Room.

PUBLIC HEALTH ENGINEERING

Second Session—Sun Room, Washington Hotel

The Sanitary and Economic Aspects of Municipal Cleansing. GEORGE A. SOPER, Great Neck, N. Y.

Street Cleaning in Washington. T. L. COSTIGAN, Superintendent of Street Cleaning, City Refuse Department, Washington, D. C.

Incineration in Washington. H. P. EDDY, JR., Metcalf and Eddy, Boston, Mass., and J. B. GORDON, Director of Sanitary Engineering, Engineering Department, Washington, D. C.

Garbage Reduction Methods. H. H. MATTHIESON, Sanitary Engineer, Department of Health, Los Angeles, Calif.

Discussion. E. E. BUTTERFIELD, M.D., Consulting Chemist, Forest Hills, N. Y.

Progress Report of the Committee on Industrial Plant Sanitation. *Chairman*, F. G. LEGG, Sanitary Engineer, Department of Health, Detroit, Mich. (To be presented by title only.)

Purification of Beet Sugar Wastes. MAX LEVINE, PH.D., Department of Bacteriology, Iowa State College, Ames, Ia.

VITAL STATISTICS

Third Session—Gridiron Room

SYMPOSIUM ON VITAL STATISTICS REGISTRATION PROBLEMS

Wednesday, 9:30 A.M.

HEALTH OFFICERS

Second Session—Small Ball Room

Health in the Philippines. M. A. DELANEY, M.D., Brigadier-General, Medical Department, Assistant Surgeon-General, War Department, Washington, D. C.

Discussion. DON L. GRISWOLD, M.D., Consulting Epidemiologist, State Department of Health, Albany, N. Y.

The Set Up, Functioning, and Administration of a Bureau of Tuberculosis in a City of 160,000. HERBERT R. EDWARDS, M.D., Director, Bureau of Tuberculosis, Department of Health, New Haven, Conn.

Discussion. ALTON S. POPE, M.D., Director, Division of Tuberculosis, State Department of Health, Boston, Mass., and HUNTINGTON WILLIAMS, M.D., Director, Department of Health, Baltimore, Md.

Physical Examination of Domestic Employees. CHARLES V. CRASTER, M.D., Health Officer, Newark, N. J.

Discussion. H. L. AKRIDGE, M.D., Health Officer, Glynn County, Brunswick, Ga., and D. L. RICHARDSON, M.D., Commissioner of Health, Providence, R. I.

Health Centers. KENNETH WIDDEMER, Executive Officer, East Harlem Health Center, New York, N. Y.

INDUSTRIAL HYGIENE

Second Session—Cabinet Room

Studies in Employee Effectiveness at the Western Electric Company. CLAIR E. TURNER, DR.P.H., Massachusetts Institute of Technology, Cambridge, Mass.

The Appraisal Form for Industrial Health Service. L. D. BRISTOL, M.D., Medical Director, American Telephone and Telegraph Company, New York, N. Y.

A Comprehensive Program of Industrial Hygiene for State Departments of Labor and Health. BERNARD S. COLEMAN, Newark, N. J.

A Study Made of 2500 Girls in a Continuation School in New York City. SOPHIE RABINOFF, M.D., Bureau of Industrial and Adult Hygiene, Department of Health, New York, N. Y.

Industrial Dermatoses. LOUIS SCHWARTZ, M.D., U. S. Bureau of Mines, Washington, D. C.

CHILD HYGIENE

Second Session—Rose Room, Washington Hotel

(Special Studies and Business Meeting)

Infant Mortality Study in Denver. A. D. H. KAPLAN, PH.D., Director, Social Studies, Bureau of Business and Social Research, University of Denver, Denver, Colo.

Infant Mortality Study in Cleveland. RICHARD A. BOLT, M.D., DR.P.H., Director, Cleveland Child Health Association, Cleveland, O.

Report of the Committee to Study and Report on the Problem of Infant and Maternal Mortality. *Chairman*, JULIUS LEVY, M.D., Consultant in Child Hygiene, State Department of Health, Trenton, N. J.

Wednesday 9:30 A.M.

CHILD HYGIENE (Cont.)

Second Session—Rose Room, Washington Hotel

Report of the Committee to Study White House Conference Recommendations. *Chairman,* HAROLD H. MITCHELL, M.D., Staff Associate, Division of Research, American Child Health Association, New York, N. Y.

Discussion.

Section Business.

PUBLIC HEALTH EDUCATION

Third Session—Hall of Nations, Washington Hotel

CLINIC ON RADIO BROADCASTING

Representative Programs of the Playlet, Dialogue, and Monologue Types will be broadcast and criticised.

Playlet Type—FLORENCE M. BAUER, assisted by W. W. BAUER, M.D., Director, Bureau of Health and Public Instruction, American Medical Association, Chicago, Ill.

Dialogue Type—JOHN L. RICE, M.D., Health Officer, and HERBERT F. HIRSCHE, Executive Secretary, Cancer Control Committee, Department of Health, New Haven, Conn.

Monologue Type—HOWARD W. HAGGARD, M.D., Associate Professor of Applied Physiology, Yale University, New Haven, Conn.

Critics: W. W. PETER, M.D., DR.P.H., Cleanliness Institute, New York, N. Y., and PHILIP G. LOUCKS, Managing Director, National Association of Broadcasters, Washington, D. C.

Wednesday, 12:15 P.M.

DIPHTHERIA PREVENTION

Special Luncheon Session—Small Ball Room

Presiding: GEORGE C. RUHLAND, M.D., Commissioner of Health, Syracuse, N. Y.

Obstructions in the No-Diphtheria Path. WILLIAM P. SHEPARD, M.D., Assistant Secretary, Metropolitan Life Insurance Company, San Francisco, Calif.

Toxoid Versus Toxin-Antitoxin. WILLIAM H. PARK, M.D., Bureau of Laboratories, Department of Health, New York, N. Y.

Securing and Continuing Records of Immunizations Performed. EDWARD S. GODFREY, JR., M.D., Director, Division of Communicable Diseases, State Department of Health, Albany, N. Y.

How State-wide Voluntary Health Associations Can Assist Official Agencies in Eradicating Diphtheria. GEORGE J. NELBACH, Executive Secretary, State Committee on Tuberculosis and Public Health, New York, N. Y.

Discussion. HENRY F. VAUGHAN, D.P.H., Commissioner of Health, Detroit, Mich.

Wednesday, 12:15 P.M.

FOOD AND NUTRITION

Luncheon Session—Fairfax Room

Address. CLYDE B. SCHUMAN, American Red Cross, Washington, D. C.

Section Business.

Wednesday, 2:30 P.M.

PUBLIC HEALTH TEN STAR FINAL

Special Session—Large Ball Room

(A Symposium on the Current Work of the Ten Sections)

Presiding: MAZŸCK P. RAVENEL, M.D., University of Missouri, Columbia, Mo.

Address by the Presiding Officer.

Laboratory **Section**—GEORGE W. MCCOY, M.D., Director, National Institute of Health, Washington, D. C.

Health **Officers Section**—HUNTINGTON WILLIAMS, M.D., Director, Department of Health, Baltimore, Md.

Vital **Statistics Section**—EDWIN W. KOPF, Metropolitan Life Insurance Company, New York, N. Y.

Public **Health Engineering Section**—ABEL WOLMAN, Chief Engineer, State Department of Health, Baltimore, Md.

Industrial **Hygiene Section**—ALICE HAMILTON, M.D., Assistant Professor, Industrial Medicine, Harvard School of Public Health, Boston, Mass.

Food **and Nutrition Section**—PROFESSOR HENRY C. SHERMAN, Department of Chemistry, Columbia University, New York, N. Y.

Child **Hygiene Section**—JAMES F. ROGERS, M.D., Consultant in Hygiene and Specialist in Health Education, U. S. Department of the Interior, Washington, D. C.

Public **Health Education Section**—IAGO GALDSTON, M.D., Director, Medical Information Bureau, New York Academy of Medicine, New York, N. Y.

Public **Health Nursing Section**—HELEN LAMALLE, R.N., Superintendent of Nursing Service, Metropolitan Life Insurance Company, New York, N. Y.

Epidemiology Section—HAVEN EMERSON, M.D., Department of Public Health Administration, Columbia University, New York, N. Y.

Wednesday, 8:00 P.M.

SECOND GENERAL SESSION

Banquet—Large Ball Room

Announcement of Awards.

The Western Branch, American Public Health Association. WILLIAM P. SHEPARD, M.D., Secretary, Western Branch, American Public Health Association, San Francisco, Calif.

Dancing.

Thursday, 9:30 A.M.

LABORATORY

Session 4A—Medical Sub-Session—Gridiron Room*

SYMPOSIUM ON BACTERIAL DISSOCIATION

Presiding: RUTH GILBERT, M.D., Division of Laboratories and Research, State Department of Health, Albany, N. Y.

Section Business.

The Dissociation of Bacterium Typhosus in Its Relation to the Production of Anti-typhoid Vaccine. FRANCIS B. GRINNELL, M.D., Department of Bacteriology and Immunology, Harvard University Medical School, Boston, Mass.

Some Variants of Bacillus Megatherium. GEORGES KNAYSI, PH.D., Department of Dairy Industry, Cornell University, Ithaca, N. Y.

A Study of the Reversion of Rough Variants. G. M. MACKENZIE, M.D., VERNAL IRONS, PH.D., and HELEN FITZGERALD, The Mary Imogene Bassett Hospital, Cooperstown, N. Y.

Dissociation of the Large Fusiform Bacillus. DAVID T. SMITH, M.D., Duke University, Durham, N. C.

Study of Variation in Erysipelas Strains. SOPHIE SPICER, M.D., Bureau of Laboratories, Department of Health, New York, N. Y.

Discussion. STANHOPE BAYNE-JONES, M.D., School of Medicine and Dentistry, University of Rochester, Rochester, N. Y., and R. R. SPENCER, M.D., Surgeon, National Institute of Health, Washington, D. C.

Parasitology in Relation to Public Health. MAURICE C. HALL, PH.D., Zoological Division, Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C.

The Advantages of Photo-Electric Over Visual Measurements as Exemplified by the Photo-Electric Scopometer. WILLIAM G. EXTON, M.D., Laboratory and Longevity Service, The Prudential Insurance Company of America, Newark, N. J.

LABORATORY

Session 4B—Medical Sub-Session—T-Room, Washington Hotel*

Presiding: M. H. MCCRADY, *Chairman*, Laboratory Section.

Section Business. (In Session 4A*)

The Antigenic Value of Commercial Diphtheria Toxoids. WILLIAM LEVIN, DR.P.H., Hygienic Laboratory, State Board of Health, and HELEN A. CARY, M.D., Medical Director, City Schools, Portland, Ore.

Comparative Evaluation of Diphtheria Toxoid Preparations and Methods of Immunization. JOHN D. MONROE, M.D., and V. K. VOLK, M.D., Oakland County Department of Health, Pontiac, Mich.

The Effect of Tonsillectomy on the Schick Test and Dick Test. WILLIAM H. PARK, M.D., Bureau of Laboratories, Department of Health, CAMILLE KERESZTURI, M.D., New York University Medical College, and OSCAR RIMSON, M.D., Fifth Avenue Hospital, New York, N. Y.

Discussion. BELA SCHICK, M.D., Pediatrician, Mount Sinai Hospital, New York, N. Y.

* Session 4A—Medical Sub-Session in Gridiron Room, and Session 4B—Medical Sub-Session in T-Room, Washington Hotel, meeting concurrently.

Thursday, 9:30 A.M.

LABORATORY (Cont.)

*Session 4B *—Medical Sub-Section—T-Room, Washington Hotel*

The Use of **Concentrated Toxoid in Immunization Against Diphtheria.** WILLIAM EDWARD BUNNEY, PH.D., Bureau of Laboratories, State Department of Health, Lansing, Mich.

Studies on **Bacterial Activity in Various Levels of the Intestines of Monkeys** and Dogs. G. M. DACK, and ELIZABETH PETRAN, Department of Hygiene and Bacteriology, University of Chicago, Chicago, Ill.

The Portals of **Entry of Brucella Abortus in Guinea Pigs.** C. L. EVERSON, D.V.M., L. J. POELMA, D.V.M., A. L. BRUECKNER, V.M.D., and E. M. PICKENS, D.V.M., Department of Bacteriology and Pathology, University of Maryland, College Park, Md.

A Study of **Opsono-Cytophagic Activity of the Blood in Brucella Infection** and **Immunity in Man.** I. FOREST HUDDLESON, D.V.M., and HOWARD W. JOHNSON, D.V.M., Central Brucella Station, Michigan State Experiment Station, East Lansing, Mich.

* Session 4A—Medical Sub-Session meeting concurrently in Gridiron Room.

HEALTH OFFICERS AND PUBLIC HEALTH NURSING SECTIONS

Joint Session—Large Ball Room

ADMINISTRATION OF PUBLIC HEALTH NURSING WORK AND THE RELATIONSHIP BETWEEN HEALTH OFFICER AND NURSE

Presiding: Chairman Health Officers Section, GEORGE C. RUHLAND, M.D., Commissioner of Health, Syracuse, N. Y., and *Chairman Public Health Nursing Section,* HELEN LAMALLE, R.N., Superintendent of Nursing Service, Metropolitan Life Insurance Company, New York, N. Y.

Points of **View of a Health Officer.** JACOB C. GEIGER, M.D., Health Officer, San Francisco, Calif.

Points of **View of a Supervisor of Nurses.** MARION W. SHEAHAN, Director, Division of Public Health Nursing, State Department of Health, Albany, N. Y.

Points of **View of a Bureau Chief.** DON W. GUDAKUNST, M.D., Director, School Health Service, Department of Health, Detroit, Mich.

Points of **View of a Field Nurse.** MARGARET D. WESTBROOK, City Nurse, Ogdensburg, N. Y.

PUBLIC HEALTH ENGINEERING

Third Session—Fairfax Room

Public Health Engineering Functions of City Health Departments (Report of the Committee on Record Forms). *Chairman,* I. W. MENDELSOHN, Washington, D. C.

Chlorine in Sewage Disposal (Report of the Committee on Sewage Disposal). *Chairman,* LANGDON PEARSE, Sanitary Engineer, Sanitary District of Chicago, Chicago, Ill.

Thursday, 9:30 A.M.

PUBLIC HEALTH ENGINEERING (Cont.)

Third Session—Fairfax Room

The Romance of the "Specialist" (Report of the Committee on Promotion of Environmental Sanitation). *Chairman*, V. M. EHLERS, Chief Sanitary Engineer, State Department of Health, Austin, Tex.

Taste and Odor Removal Processes (Report of the Committee on Water Supply). *Chairman*, J. R. BAYLIS, Physical Chemist, Department of Public Works, Chicago, Ill.

Occurrences of Fluorine in Water (Report of the Sub-Committee on Ground Water). *Sub-Chairman*, W. S. JOHNSON, State Board of Health, Jefferson City, Mo.

The Application of the Principles of Water Purification to Swimming Pool Control Programs. A. H. FLETCHER, Sanitary Engineer, Department of Health, Memphis, Tenn., and A. E. CLARK, Associate Sanitary Engineer, State Department of Health, Nashville, Tenn.

Progress Report of the Committee on Waterways Pollution. *Secretary*, L. F. WARRICK, State Sanitary Engineer, State Board of Health, Madison, Wis. (To be presented by title only.)

PUBLIC HEALTH EDUCATION

Fourth Session—Small Ball Room

PARTICIPATION OF THE MEDICAL PROFESSION IN HEALTH EDUCATION

HENRY F. VAUGHAN, D.P.H., Commissioner of Health, Detroit, Mich.
W. W. BAUER, M.D., Director, Bureau of Health and Public Instruction, American Medical Association, Chicago, Ill.
W. S. LEATHERS, M.D., School of Medicine, Vanderbilt University, Nashville, Tenn.
RAYMOND H. GREENMAN, Executive Secretary, Tuberculosis and Health Association, Rochester, N. Y.

Discussion Leader. IRA V. HISCOCK, Professor of Public Health, Yale University, New Haven, Conn.

INDUSTRIAL HYGIENE SECTION AND AMERICAN SOCIAL HYGIENE ASSOCIATION

Joint Session—Sun Room, Washington Hotel

SYPHILIS: AN INDUSTRIAL PROBLEM

Presiding: C.-E. A. WINSLOW, DR.P.H., Yale University, New Haven, Conn.

Losses and Risks to Industry Attributable to Syphilis. J. R. GARNER, M.D., Chief Surgeon, Atlanta and West Point Railroad Company, the Western Railway of Alabama, Georgia Railroad, Atlanta, Ga.

Should the Treatment of Syphilis Be Included Under the Medical Benefit Arrangement of Industries? C. H. KIBBEY, M.D., Director of Sanitation, Tennessee Coal, Iron and Railroad Company, Fairfield, Ala.

Thursday, 9:30 A.M.

INDUSTRIAL HYGIENE SECTION AND AMERICAN SOCIAL HYGIENE ASSOCIATION (Cont.)

Joint Session—Sun Room, Washington Hotel

A General **Plan for the Prevention and Treatment of Syphilis in Large Industries.** WILLIAM F. SNOW, M.D., General Director, American Social Hygiene Association, New York, N. Y.

Thursday, 12:15 P.M.

PUBLIC HEALTH EDUCATION

Luncheon Session—Small Ball Room

Presiding: IAGO GALDSTON, M.D., Director, Medical Information Bureau, Academy of Medicine, New York, N. Y.

Mopping Up. *Informal Discussion.*

Thursday, 2:30 P.M.

FOOD AND NUTRITION

Third Session—Fairfax Room

Report of the **Committee on Milk and Dairy Products.** *Chairman,* WILLIAM B. PALMER, Milk Inspection Association of the Oranges, Orange, N. J.

Further **Studies on the Growth of Cl. botulinum in Defrosted Peas.** R. P. STRAKA and LAWRENCE H. JAMES, PH.D., Food Research Division, U. S. Bureau of Chemistry and Soils, Washington, D. C.

Report of the **Committee on Fruits and Vegetables.** *Chairman,* WALTER H. EDDY, PH.D., Teachers College, Columbia University, New York, N. Y.

SYMPOSIUM ON MILKS OF SPECIAL ANTIRACHITIC VALUE THEIR DEVELOPMENT AND USE

Opened by PROFESSOR HENRY C. SHERMAN, Department of Chemistry, Columbia University, New York, N. Y.

Antirachitic Activation of Milk by Direct Irradiation with Ultra-Violet Rays. GEORGE C. SUPPLEE, PH.D., Director of Research, The Dry Milk Company, Bainbridge, N. Y.

The **Addition of Vitamin Concentrates to Milk.** THEODORE F. ZUKER, PH.D., Assistant Professor of Pathology, Columbia University, New York, N. Y.

A Preliminary Report upon the Protective Value for Infants of Various Types of Vitamin D Fortified Milk as Compared with Protective and Curative Experiments in Rats. JOHN M. MCK. MITCHELL, M.D., JOSEPH STOKES, JR., M.D., DOROTHY V. WHIPPLE, M.D., Pediatric Department, and JOHN EIMAN, M.D., Associate Pathologist, Medical School, University of Pennsylvania, Philadelphia, Pa.

The **Rôle of Activated Milks in the Anti-Rickets Campaign.** ALFRED F. HESS, M.D., New York, N. Y.

Thursday, 2:30 P.M.

VITAL STATISTICS

Fourth Session—Gridiron Room

Report of the Committee on Proper Allocation of Records. *Chairman,* J. V. DEPORTE, PH.D., Director, Division of Vital Statistics, State Department of Health, Albany, N. Y.

Biometric Studies on United States Army Officers: Somatological Norms in Disease. LOWELL J. REED, PH.D., Department of Biostatistics, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.

Discussion. J. V. DEPORTE, PH.D., Director, Division of Vital Statistics, State Department of Health, Albany, N. Y.

More Uniformity and Reliability in Records. HAROLD B. WOOD, M.D., Epidemiologist, Department of Health, Harrisburg, Pa.

An Original Method of Computing the Probable Approximate Number of Chronic Typhoid Carriers in the State of Maine. WILLIAM L. HOLT, M.D., Director, Division of Communicable Diseases, Department of Health and Welfare, Augusta, Me.

Report of the Committee to Coöperate with the National Safety Council in Preparing Forms for Additional Information Regarding Accidents. *Chairman,* W. THURBER FALES, SC.D., State Registrar, State Board of Health, Montgomery, Ala.

CHILD HYGIENE

Third Session—Small Ball Room

NEW AND INTERESTING DEVELOPMENTS IN THE CHILD HEALTH FIELD

Estimation of the Effectiveness of Child Health Programs in Ontario by Survey Methods. JOHN T. PHAIR, M.B., D.P.H., Director, Division of Child Hygiene, Provincial Department of Health, Toronto, Ont.

A Report on Handwashing Facilities in Public Schools. SALLY LUCAS JEAN, Health Consultant, New York, N. Y.

A Plan for Promoting More Accurate Records of Infant Hygiene Work. C. A. SARGENT, M.D., Director, Division of Child Hygiene, State Board of Health, Dover, Del.

Practical Parental Education. ROSAMOND PRAEGER, R.N., Supervisor, Child Development and Parental Education, Board of Education, Syracuse, N. Y.

The Part the Laity Plays in a Rural Child Health Program. ELMA ROOD, R.N., Director of Health Education, Children's Fund of Michigan, Detroit, Mich.

The Denver Plan of Parental Education. JESSIE I. LUMMIS, Executive Secretary, Denver Tuberculosis Society, Denver, Colo.

Announcement. LOUISE STRACHAN, Director, Child Health Education, National Tuberculosis Association, New York, N. Y.

INDUSTRIAL HYGIENE

Third Session—Cabinet Room

In Re Silicosis. JACOB GOLDBERG, PH.D., New York Tuberculosis and Health Association, New York, N. Y.

Thursday, 2:30 P.M.

INDUSTRIAL HYGIENE (Cont.)

Third Session—Cabinet Room

Toxicity of **Organic Fluorides.** WILLIAM P. YANT, M.D., U. S. Bureau of Mines, Pittsburgh, Pa.

Experimental **Data in Acute Silicosis.** RALPH POMERANZ, M.D., Radiologist, Tuberculosis Division, Department of Health, Newark, N. J.

Pathology **Attending Asphyxia from Carbon Monoxide and Atmospheres Deficient in Oxygen.** R. R. SAYERS, M.D., U. S. Bureau of Mines, Washington, D. C.

The Effect of **Talc on Workers.** W. C. DREESEN, M.D., Assistant Surgeon, U. S. Public Health Service, Washington, D. C.

INSTITUTE ON HEALTH EDUCATION

Under the Auspices of the Public Health Education Section

The purpose of the Institute is to provide instruction in the content and methodology of Health Education to a limited number of persons actively engaged in Health Education.

Active Health Education workers in official departments of health—state, county and city—and in voluntary agencies are invited to enroll.

Health officers and directors of health organizations are urged to send to the Institute the individuals responsible for Health Education activities in their units.

The registration fee is $5.00. Write the Association office for enrollment blanks.

Saturday, October 22, 9.00 A.M.–12.00

HEALTH EDUCATION INSTRUMENTS

Discussion of the instruments employed in Health Education; pamphlets, weekly and monthly publications and bulletins, charts, posters, health talks and radio talks; their special utility and their limitations.

Discussion Leader: EVART G. ROUTZAHN, Russell Sage Foundation, New York, N. Y.

Discussers: BERTRAND BROWN, Director, Division of Publications, Milbank Memorial Fund, New York, N. Y., and W. W. PETER, M.D., Cleanliness Institute, New York, N. Y.

Saturday, October 22, 2.00 P.M.–5.00 P.M.

SOURCES OF INFORMATION

The responsibility of the health educator for the authenticity of his material. How to go about securing dependable information to present on the items selected, to the indicated audiences, and through the preferred mediums. Tapping authoritative sources. The coöperation of the medical profession.

INSTITUTE ON HEALTH EDUCATION (Cont.)

Saturday, October 22, 2.00 P.M.–5.00 P.M.

SOURCES OF INFORMATION

Discussion Leader: IRA V. HISCOCK, Yale University, New Haven, Conn.
Discusser: CLAIR E. TURNER, DR.P.H., Massachusetts Institute of Technology, Cambridge, Mass.

Sunday, October 23, 9.00 A.M.–12.00

BUILDING PROGRAMS

How to formulate a program of Health Education suitable to the community. How to determine the allocation of staff, money and effort. This problem will be considered from the viewpoint of both the official agency, that is, the department of health, and of the voluntary agencies.

Discussion Leader: RAYMOND H. PATTERSON, PH.D., Life Conservation Service, John Hancock Mutual Life Insurance Company, Boston, Mass.
Discusser: IRA V. HISCOCK, Yale University, New Haven, Conn.

Monday, October 24, 9.00 A.M.–12.00

PROGRAM EXECUTION

The avenues through which the program might be formulated; the population at large, special groups, schools, primary and secondary, teacher training organizations, work shops and work places, commercial organizations, etc.

Discussion Leader: W. W. BAUER, M.D., Director, Bureau of Health and Public Instruction, American Medical Association, Chicago, Ill.
Discussers: GEORGE C. RUHLAND, M.D., Commissioner of Health, Syracuse, N. Y., and EVART G. ROUTZAHN, Russell Sage Foundation, New York, N. Y.

A question period will be arranged for at the end of each discussion though the participants in the Institute will be privileged to interrupt the discusser with pertinent questions.

MEETINGS OF OTHER ORGANIZATIONS

AMERICAN ASSOCIATION OF SCHOOL PHYSICIANS

All meetings will be held in the Washington Hotel.

Friday A.M., October 21. Joint Session with the International Society of Medical Health Officers.
Friday P.M. Individual Session.
Saturday A.M., October 22. Joint Session with the International Society of Medical Health Officers.
Saturday P.M. Individual Session.
Saturday Evening. Business Meeting.
Sunday Evening, October 23. Dinner Session. Joint with the International Society of Medical Health Officers.

AMERICAN ASSOCIATION OF SCHOOL PHYSICIANS

Tuesday A.M., October 25. Joint Session with Child Hygiene and Public Health Nursing Sections.

INTERNATIONAL SOCIETY OF MEDICAL HEALTH OFFICERS

All meetings will be held in the Washington Hotel.

Friday A.M., October 21. Joint Session with the American Association of School Physicians.

Saturday A.M., October 22. Joint Session with the American Association of School Physicians.

Sunday Evening, October 23. Dinner Session. Joint with the American Association of School Physicians.

Business Meeting.

CONFERENCE OF STATE SANITARY ENGINEERS

All day Saturday, October 22, Fairfax Room.

Monday A.M. Individual Session, Fairfax Room.

Monday P.M. Joint Session with the Public Health Engineering Section, Small Ball Room.

Tuesday. Annual Engineers' Stag Dinner Party, Small Ball Room.

STATE LABORATORY DIRECTORS' CONFERENCE

Sunday, October 23. Luncheon to be followed by an afternoon program of round table discussions of questions pertaining to the administration of state laboratories, Gridiron Room.

(Limited to Directors of State Health Department Laboratories, State Branch Laboratories and their Principal Assistants.)

ASSOCIATION OF WOMEN IN PUBLIC HEALTH

Monday Evening. Dinner Session, Cabinet Room.

DELTA OMEGA

Tuesday. Luncheon Session, Gridiron Room.

EXECUTIVE COMMITTEE, HEALTH DIVISION, NATIONAL CONFERENCE OF SOCIAL WORK

Thursday. Luncheon Session, Committee Room.

HEALTH COUNCIL EXECUTIVES

Wednesday. Luncheon Session, Gridiron Room.

AMERICAN SOCIAL HYGIENE ASSOCIATION

Thursday, Friday and Saturday, October 27, 28, and 29. Social Hygiene Regional Conference.

Thursday P.M. Joint Session with Industrial Hygiene Section, Sun Room, Washington Hotel.

NATIONAL SHELL FISHERIES ASSOCIATION AND OYSTER GROWERS AND DEALERS ASSOCIATION OF NORTH AMERICA, INC.

Friday and Saturday, October 28 and 29. All day, Fairfax Room.

Biology

Sex Cycles in Oysters.
Chemical Influences upon Spawning.
Artificial Control of Oyster Reproduction.

Food and Nutrition of Shellfish

Plankton Foods.
Mineral Requirements.
Vitamin Potencies in Oyster Foods.
Greening and Other Colorations in Oysters from Physiological and Chemical Standpoints.

Food and Nutritive Values

Human Nutritional Values of Shellfish, Especially Oysters.
Chemical Characteristics of Oyster Tissues with Respect to Carbohydrates (Glycogen), Proteins and Fats.
Mineral Values in Oysters.
Prevention and Correction of Nutritional Anemias.
Iodine in Animal Metabolic Processes and the Value of Iodine in Shellfish.
Vitamins and Other Special Nutritive Values in Shellfish, Especially Oysters, for the Prevention of Food Deficiencies and Protection Against Toxic Food Conditions.

Food Processes and Packaging

Packaging and Preservative Processing of Shellfish, Including Heat Treatment, Quick Freezing, etc.

Hygienic Supervision

Sanitation of Industrial Shellfish Activities, Including Field Methods, Laboratory Investigational Procedures.

LETTER FROM GREAT BRITAIN

THE ROYAL SANITARY INSTITUTE HEALTH CONGRESS

THE congress of the Royal Sanitary Institute, the most important of the several health congresses held annually in Great Britain, concluded its deliberations after a full week on Saturday, July 16. The forty-third of the series, the meeting on this occasion was held at Brighton on the invitation of the Mayor and Corporation of the town. From every point of view the congress may be claimed to have scored a success. Certainly it was a most enjoyable meeting, and the considerable amount of work set down to be done was tackled and carried through with the right spirit of cheerfulness and enthusiasm. The total attendance numbered just under 1,400, a figure which, while rather less than that for last year, is rather over the average of recent years.

Among representatives from countries other than Great Britain and the overseas dominions, it was a great pleasure to find a sizeable contingent from the United States of America in the persons of Dr. W. C. Billings, Medical Director at American Consulate General, London; Past Asst. Surgeon F. J. Halpin of the Consulate in Southampton; and Dr. Blanche Sterling of Washington—all of the U. S. Public Health Service; and Dr. Josephine Baker, well known pediatrist. James L. Tighe represented, as he has done before, the Massachusetts State Board of Health; and Professor Winslow filled the dual rôle of representative of the American Public Health Association and Yale University. Professor Sundwall, of the University of Michigan, who, in all innocence, had visited London for the purpose, I imagine, of looking at the School of Hygiene and such like activities, also found himself making part of the congress and sharing in the work and several of the discussions.

As a humble—and Honorary—Fellow of the American Public Health Association, indeed, it affords me considerable gratification to be in a position to record that members of that body in several spheres made contributions of real moment to the proceedings. At the inaugural meeting, Dr. Billings, acting as spokesman of the representatives from abroad, in a graceful speech voiced congratulation and expressed thanks to the President of the congress (Lord Leconfield, Lord Lieutenant of Sussex and Chairman of the County Council) for his address. Professor Winslow and Professor Sundwall both took part in discussions at the Preventive Medicine and other sections. The former, in addition, delivered what is called "the lecture to the congress," and by his peroration to an address on "Current Tendencies in American Public Health" evoked an enthusiasm of an intensity definitely astonishing on the part of a people commonly regarded as equally devoid of both enthusiasm and sense of humor.

As the congress met in some twelve sections and conferences, the number of subjects discussed was considerable. Also there was no lack of variety, great thoughts on bed-bugs calling forth opinions no less helpful and profound than those expressed with regard to such problems as the prevention of cancer, the medical treatment of the sick poor, the necessity for birth control, and the advisability of repealing the laws relating to compulsory vaccination. These subjects were dealt with in sections or at conferences in which medical officers of

health particularly were concerned and interested, and some of them proved so attractive—birth control and vaccination, for example—that attendances of round about 400 were secured and even standing room was unobtainable. So far as conclusions are concerned, in the case of birth control and vaccination, at any rate, it seemed pretty definite that there was a determination that the time had arrived for doing something about them. Among communications received at the congress it is perhaps worth noting that the message from the Minister of Health was particularly encouraging. His suggestion that the watchword of the congress should be "the efficient maintenance of essential services with a thorough elimination of all unnecessary or wasteful expenditure" was not regarded as foreshadowing anything drastic in the shape of cuts.

THE MINISTRY OF HEALTH REPORT

THE report of the Ministry of Health, which made its appearance the other day, is a survey of the whole work of the department. Though it deals fairly fully with purely health questions, for the reason that the Chief Medical Officer (Sir George Newman) himself publishes a separate report, the discussion of this aspect of the Ministry's activities is less complete than it might be.

Sanitary administration, housing and town planning, local finance, administration of the poor law, national health insurance, and contributory pensions, etc., all receive attention, and a vast amount of information, statistical, in respect of expenditure and so on is offered with regard to them. Considerable activity, it is noted, was shown in relation to water supply in rural areas particularly, loans for over £900,000 (five million dollars or so) having been sanctioned.

Unemployment grants are stated to have been especially helpful in stimulating rural schemes. Large expenditures are shown to have been made in connection with housing and improvement schemes. The actual amount paid by way of government grants in housing subsidies during the year ended March 31, 1932, was over £12,000,000—60 million or so dollars.

The total expenditure on subsidized housing since 1919 is now approximately £630,000,000, representing a figure in dollars I dare not try to calculate or to write down in these days when our, always welcome, American visitors can get a British pound for round about 3½ dollars.

In regard to poor law, national health insurance and contributory pensions, again a number of striking and interesting figures are given. During the year the average number of persons in receipt of institutional and domiciliary relief amounted to 1,046,079, representing 262 per 10,000 of the population. This is considerably higher than in the previous year, though it is pointed out that the process of appropriating poor law institutions for public health and other purposes has continued to contribute to the reduction in the number of persons receiving relief in poor law institutions.

An interesting test made during the first week of February of this year, to discover the number of persons (in England and Wales) insured under the Unemployment Insurance Acts who received concurrently out-relief and benefit under the Acts, showed the total numbers to be just under 25,000, the dependents numbering 76,329. The insurance payments made during the week totalled over £32,000 and the amount of out-relief £7,853.

In respect of pensions some of the figures given are rather striking: at March 31, 1932, in England and Wales alone the number of beneficiaries receiving widows' pensions amounted to 320,984 widows and 246,112 children, orphans' pensions numbering 13,222. The amount paid during the year was

over 14½ million pounds—70-odd million dollars.

MEDICAL BENEFIT UNDER THE INSURANCE ACTS

AS showing the extent and cost of medical service under the Insurance Acts, it is noted that the number of physicians in insurance practice was 14,840; the number of insured persons entitled to medical benefit approximately 15,000,000, and the cost of the benefit over £8,941,000, of which sum the doctors received over £6,467,000, and the insurance chemists for drugs, etc., £1,987,000. No analysis of the conditions encountered and dealt with by the insurance practitioners is given in this report, any references to disease and prevention, indeed, being limited to the part dealing with public health.

Here special consideration is given to tuberculosis and venereal diseases in connection with the descriptions of the progress of treatment and preventive schemes. In respect of venereal disease it is noted that whereas the number of attendances at treatment centers has increased, the number of new cases both of syphilis and gonorrhea is down. The decrease in the former is 4.40 per cent as compared with 1930. In the case of gonorrhea the decrease is approximately 7.47 per cent.

THE TUBERCULOSIS CONFERENCE

AS regards tuberculosis the Ministry of Health report notes a definite decrease in the number both of new cases and of deaths in the case of the non-pulmonary form; the actual figures are—deaths 6,160 and cases 18,378. The number of deaths from and cases of pulmonary tuberculosis shows in each instance an increase over that for 1930—54,596 cases as against 54,331, and 29,658 deaths as compared with 29,414. These increases mean probably very little, and certainly called forth no particular comment during the annual conference of the National Association for the Prevention of Tuberculosis held in London toward the end of July.

Possibly for the reason that the majority of the papers submitted were of a clinical or scientific character, the press secured by the conference was not too good. The nearest approach to sensationalism was made by Dr. Bardswell, an officer of the London County Council and an authority on tuberculosis. Discussing the question of the protection from tuberculosis of the young adult, Dr. Bardswell pointed out that the increase in the death rate from the pulmonary form among young women at ages 15–20 and 20–25 was practically limited to the unmarried. In London he believed waitresses and machinists and others engaged in the poorly paid trades supplied more than their proportionate share of adolescent cases of the disease. In his view, the fact that the young married woman did not break down as did the unmarried worker of the same age was proof of the advantage gained by removal from the ranks of wage earners and the stress of competition.

Another speaker, discussing the recent relative increase of pulmonary tuberculosis in young adults, expressed the view that to a considerable extent it was due to a larger proportion of persons reaching the young adult age without previously having acquired tuberculous infection. Which serves to remind me of the plea of a certain distinguished physician in favor of leaving tuberculous milk alone because he felt that it would be wrong to deprive children of the repeated small doses of tubercle bacilli which served to prepare them for and protect them against the larger doses they were certain to encounter in later life. The fact that there was a real risk of acquiring abdominal or some other form of tuberculosis was, it appeared, not worth worrying about.

CHARLES PORTER, M.D.

London

PUBLIC HEALTH ADMINISTRATION

HEALTH DIVIDENDS*

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MONEY which is spent by an individual or a community may be classified either as an expense or an investment. Many individuals and communities have in the past, and unfortunately even at the present time, looked upon money, time, or effort spent in health protection as an expense. This is due to an entirely wrong conception of the object sought and the results attained through the efforts put forth.

Money spent for this purpose culminated in many intangible results. In addition we get such results as lowered incidence of sickness and less time lost from work; increased average school attendance due to less sickness; reduction in number of cases and deaths due to communicable diseases; lessening in death rate among infants; and many other similar results.

EXAMPLES OF RETURNS FROM INVESTMENT—PRESTON AND KANAWHA

A concrete example will serve to illustrate the actual money saving resulting from the carrying on of a definite preventive program.

In the County of Preston, W. Va., a study and comparison of the incidence of and cost of diphtheria alone, for the 3-year period prior to the organization of a whole-time health service, and for the 9-year period following its organization, gives very startling and definite information regarding the difference in cost to the citizens of the county during these two periods.

There was a total saving to the citizens of the county during the past 9 years from the control and prevention of diphtheria alone of $291,759.03. In other words, from a total investment of $54,000 by the county itself during the 9-year period, a return of over 540 per cent was received.

TABLE I

THREE-YEAR PERIOD PRIOR TO ORGANIZATION OF WHOLE-TIME HEALTH UNIT, COUNTY OF PRESTON, W. VA., 1920–1922, INCLUSIVE

Total cases of diphtheria reported 226 with 23 deaths

Analysis of cost of cases and deaths:	
226 cases, medical care, average $50 each (average 75.3 cases per year)	$ 11,300.00
23 deaths, average cost of each funeral $200 (average of 7.66 deaths per year)	4,600.00
23 deaths, average value of each life $5,000	115,000.00
Total cost for 3 years	$130,900.00
Average cost per year	43,333.33

* *Quart. Bull.*, West Virginia State Dept. of Health, 19, 3 (July), 1932.

TABLE II

NINE-YEAR PERIOD SINCE ORGANIZATION OF WHOLE-TIME COUNTY HEALTH UNIT, COUNTY OF PRESTON, W. VA., 1923–1931, INCLUSIVE

Total cases of diphtheria reported 211, with 7 deaths (average of 23.4 cases and 0.77 deaths per year)

Analysis of cost of cases and deaths:	
211 cases, medical care, average $50 each	$ 10,550.00
7 funerals, average cost of each funeral $200	1,400.00
7 deaths, average value of each life $5,000	35,000.00
Total cost for 9 years	$ 46,950.00
Average cost per year	5,216.00
General summary and comparison:	
Average annual cost for period before organization of health unit	$ 43,633.33
Average annual cost for period since organization of health unit	5,216.66
Average annual saving during past 9 years	$ 38,417.67
Average annual cost to county for health unit	6,000.00
Net average annual saving to county	$ 32,417.67

Another similar example comes from Kanawha County, in which a whole-time health service was commenced in 1926. Prior to this time approximately $8,000 had been spent by the county annually to care for smallpox cases occurring in the county. Since the organization of the county health unit no money has been expended for this purpose other than the small amount involved in the purchase of smallpox vaccine.

These examples represent types of actual saving to the communities in which a definite preventive program is being carried on. Similar illustrations could be duplicated many times over in regard to other ways in which money is saved by this type preventive program.

A few years ago a small city and adjacent community in the northern section of West Virginia had quite an epidemic of smallpox. When we visited this community to investigate the conditions and to get the situation under control, the owner of one of the largest stores in the city stated that during the 2 weeks in which the epidemic had already existed, the merchants of the city had lost over $10,000 a week, due to customers who had gone elsewhere to trade because of fear of contagion from the disease. This latter example illustrates the cost to a community as a consequence of failure to provide for a program of prevention.

The evidence is indisputable that a well organized health service is a paying investment to any community, and should never be considered as simply an expensive luxury, but as an essential and necessary service.

Organized Medicine and Public Health—A symposium on the relation of the general practitioner to preventive medicine was held at the annual meeting of the American Medical Association in New Orleans and is reported in the *Journal of the American Medical Association* for June 11, 1932. The authors included G. Gill Richards, Roger I. Lee, Morris Fishbein, and J. N. Baker.

The family physician will always be a most important part in any plan of medical care, whether curative or pre-

ventive in character. Medical participation in health work can do much to extend the influence of preventive services and thus reduce needless sickness and mortality.

HEALTH DEPARTMENT REPORTS

Newton, Mass.—The 1931 per capita expense of the board of health amounted to $.87. Only 1 case of diphtheria was reported in this city of 68,223 population during the year. There were 209 cases of scarlet fever reported, of which 41 per cent were hospitalized. The 123 cases not hospitalized occurred in 95 different homes in which there were 120 other children. There were 4 instances in which secondary cases occurred in the non-hospitalized group as contrasted with no secondary cases among the 164 children who lived in homes from which the cases were hospitalized.

Connecticut—The 1931 annual report of the State Department of Health indicates that the health of the state was particularly good during the year and that certain diseases, including measles, smallpox, diphtheria, and whooping cough, reached a low prevalence. For the third successive year, the typhoid death rate remained below 1.0 per 100,000 population.

Approximately 89 per cent of the population of the state are served by public water supplies, about 24 per cent of the population receive filtered water and 67 per cent receive water that has been protected by chlorination. Summer round-ups carried out in coöperation with the Connecticut Congress of Parents and Teachers resulted in 122 being held, and 2,290 children who were to enter school for the first time were examined as to their physical defects. the state with a population of 1,608,232 has 4,860 registered nurses, besides 1,173 registered outside the state. The public health instruction division records that over 180,000 persons were reached by exhibits, talks, and film showings besides those reached through 49 radio talks.

Oakland County, Mich.—According to the 1931 annual report of the county health department, 1,235 school children were referred to private physicians for the correction of physical defects discovered by school health examinations. It is also noteworthy that 53 per cent of the school population have been immunized against diphtheria, 9.4 per cent having been given the immunizing doses by their family physician.

The county laboratory made 46,472 examinations during the year at an average cost per examination of $.17. The public health education service distributed 30,000 baby letters, 6,000 diphtheria immunization letters, and 4,000 each of May Day publications, health examination bulletins, *Child's Bill of Rights*, summer round-up leaflets, besides several thousand other bulletins. A creditable report describes in detail the health services rendered to the residents by this county department.

Quincy, Mass.—A progressive change in the health department organization occurred in 1931 by the establishment of a separate division of vital statistics and the employment of a full-time statistician. It is noteworthy that 97 per cent of the milk supply is pasteurized. There were 46 habit clinics held during the year, with 70 new cases and 93 old cases in attendance. Visits by children, chiefly referred by the school department and by individuals (9 by physicians) numbered 234, while 404 visits were made by the social worker. In the child guidance clinic conducted by the Medfield State Hospital, there were 55 new cases and 20 continued cases. This clinic, held in the Home Making School, was initiated at the request of the board

of public health and the public school authorities. Direct contact is maintained with the school authorities who visit the clinic. There are 10 coöperating agencies.

Pike County, Ky.—This annual report for 1931 is dedicated to "The Kentucky Blue Ribbon Children, the nucleus for a higher standard of mental and physical efficiency." There has been nothing found quite equal in value for the instruction of school children concerning the laws of health and hygiene, states the report, to the Blue Ribbon system adopted by the Bureau of Maternal and Child Health of the Kentucky Board of Health.

The requirements call for reasonable norms of growth in height and weight, normal or corrected vision, teeth and tonsils, good posture and health habits, ability to pass the school examinations, vaccination against smallpox, and immunization against diphtheria if under 10 years of age. "What is usually found after these requirements are complied with is a normal, healthy, growing child, with normal physical and mental efficiency. These children are usually more contented, more industrious, more active, have a pleasanter disposition, rarely tardy, and in my observation of the children, I have no knowledge of a case of delinquency."

All of the 215 graded schools of the county were visited during the year in conjunction with an intensive program of health education and study of physical conditions of the children. Records were also made of crippled children during the time of school visits. Of 186 cases recorded, 70 attended the Crippled Children's Clinic which was held under the direction of the Kentucky Crippled Children's Commission. Forty of these cases were recommended for hospital treatment, and most of them are receiving care. This report concludes with a 1-page statistical summary of major activities and services, with a final page devoted to a map of the area showing the location of schools, roads and principal towns.

San Luis Obispo County, Calif.—One of the most interesting annual reports of the year is the mimeographed record of this county of 39,262. A letter from the health officer to the county board of supervisors gives the purpose and method of preparation of the report, which follows in outline and content the A.P.H.A. *Appraisal Form for Rural Health Work*. A table of contents, an index, together with a map of the state, and a brief description of the county are aids to the reader. The report is a fairly comprehensive health survey of the county, prepared in an interesting and graphic manner. A careful accounting is made of the cost of health services for a period of years and of the sources of revenue.

During the past fiscal year, gross expenditures amounted to $28,169, but fees from birth and death certificates, sanitary inspections, immunizations, and other sources, reduced the actual cost to $25,843. Of the tax payers' dollar, a pie chart shows that $.40 were for education, $.21 for general government, $.20 for trust funds and agency transactions, $.13 for charities and correction, $.05 for protection of person and property, and $.01 for public health.

A crude death rate of 8.4 and an infant mortality rate of 57.5 are recorded. During the past 2 years, over 670 children have been given immunization treatment against diphtheria by the health department. The only case of this disease in 1931 was that of a child who arrived in the county a few days before he became ill. A detailed analysis is made of the poliomyelitis problem in 1930 when there were 67 cases. There was only 1 case last year. Eight cases of typhoid fever developed in 1931 with 1 death. The cases were traced to

transients who were in the county when they became sick and infected others before they could be isolated.

Each section of the report first presents standard objectives of service, followed by a frank analysis of accomplishments in the county. Three cities have contracted with the County Board of Supervisors to perform the health work of those cities. In order to carry out this work in an economical manner the county health office is located in the largest city, while one public health nurse resides and holds her office in the next largest city. Various officers of the department visit each of these cities once or twice a week and by telephone communication maintain direct contact in order that prompt service may be rendered when needed.

Duke Endowment—The sixth annual report of the hospital section of the Duke Endowment, for 1930, is an impressive record of valuable service in the development of hospital facilities in North and South Carolina. While 6 years ago the private hospitals had 55 per cent of the general beds in North Carolina and 45 per cent in South Carolina, they now have 42 per cent and 28 per cent, respectively, of these beds in the two states. Since 1924, the groups of non-profit hospitals operated by religious organizations and municipalities have increased 1 each in number, and the county group 2, but the group operated by board of trustees for the communities in which they are located has increased 30 in number (from 23 to 53) and 1,700 in bed capacity.

Contributions were made for the care of free patients in 1930 to 103 institutions in the two states. These included 80 general hospitals, 16 tuberculosis sanatoriums, and 7 special hospitals. At the end of the year these hospitals reported 6,300 beds for patients. Of beds available, 58.4 per cent were occupied on the average day, 54.3 per cent in the general hospitals, 79.4 per cent in the tuberculosis sanatoriums, and 71.8 per cent in the special hospitals. The beds for negroes numbered 25.8 per cent of the total. The report contains interesting photographs, building plans, statistical analyses and descriptive text, and is a valuable contribution to the subject of hospital service in small communities and rural areas.

National Tuberculosis Association—The 1931 report announces that the death rate from tuberculosis in the United States of 67 is now one-third of what it was when the organization was founded in 1904. "Tuberculosis still takes its greatest toll in the most important years of life, namely, from 15 to 45," and ranks first as the cause of death in this age group, with 1 out of every 5 deaths charged to it. A newly organized publicity department will handle publicity for the Seal Sale and for the Early Diagnosis Campaign, will assist other departments of the association, and will also try to give aid to the publicity work of state and local associations by means of field visits and correspondence. The valuable services rendered in the nursing and industrial fields are noted. "The preventive phase of industrial hygiene has shown marked strides within the past few years and opportunity is given for much health education work through the channels now opened by this newer phase of industrial hygiene."

LABORATORY

A PROJECTION METHOD FOR DEMONSTRATING PARTICLES SUSPENDED IN FLUID

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IT is generally conceded that when any phenomenon is to be demonstrated to an audience, the most practical manner in which to accomplish this is to make that phenomenon apparent to all of the observers at the same time. When particles in suspension are to be demonstrated, there is a difficulty in showing them to large groups at the same time and from the same point of view. Moreover, it is time consuming since it is necessary to give individual demonstrations or, at best, to only small groups.

To obviate some of the difficulties, the method herein described makes practical use of the parallel rays passing through a column of fluid in which particles are suspended to cast a shadow on a screen. An ordinary projection lantern is employed for its source of light as well as its magnifying properties. The images of the particles are cast upon a screen in a darkened room.

Round tubes are not satisfactory for this purpose on account of the refraction and diffusion of the light. It is necessary to have rectangular chambers so that the rays passing through the fluid are parallel.

The rectangular chamber is constructed by placing a thin brass strip, $^1/_{16}$" thick and $^1/_8$" wide, bent in the shape of the letter "U," between two microscope slides. By means of two screw clamps (used to clamp rubber tubing) applied at the ends of the slides

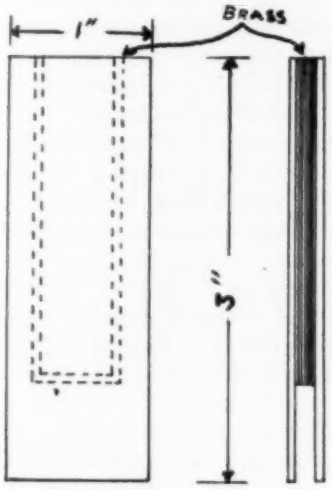

FIGURE I

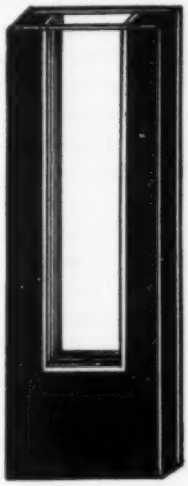

FIGURE II

in such a manner as to exert sufficient pressure, the brass strip is held in place. The ends of the strip are bent so that the space between them is ½" in width, ⅛" in depth and 2¼" in height, having a capacity of 0.14 cu. in. or 2.3 c.c. This allows for a border ¼" wide to the edges of the slides to be filled in with a solid substance such as sealing wax (Figure I). Sealing wax has been found most satisfactory because of its great cohesiveness and its rapidity of solidification. The chamber is shown in Figure II.

A panel is constructed to fit the projection lantern. This panel is placed anterior to the lenses through which the parallel rays from the source of light are transmitted. In the middle of the panel is a slit ½" wide and of the height of the column of fluid through which the rays are to pass. It is so situated that after the rays pass through the fluid in the chamber, they will continue through the center of the magnifying lens at the anterior end of the lantern. To accommodate the chamber and hold it in place in front of the slit in the panel, a slot is constructed into which the chamber can be inserted easily.

This arrangement has proved quite satisfactory for the demonstration of agglutinated bacteria as well as the particles in the Kahn precipitation test. When thrown on the screen, the images are enlarged sufficiently to enable one to determine differences between the sizes of particles in suspension.

The Purification and Concentration of Diphtheria Toxoid—This paper reports the results obtained in purifying diphtheria toxoid by precipitation with acetone, at low temperatures. The precipitated toxoid was obtained as a dry powder, readily soluble in aqueous solutions. The powder itself appears to be stable. When dissolved in half the original volume of physiological salt solution, the toxoid remained stable in the cold room for a period of 7 months. Only those toxoids should be used which have been completely detoxified by the treatment with formalin. The formalin is immediately and completely removed by precipitation with acetone.

Filtration through a Mandler filter, or the addition of preservative to the toxoid, did not impair its activities. The flocculating value of the purified toxoid, containing phenol, was lowered considerably by freezing at —10° C., while when merthiolate was used as a preservative, it remained unchanged. In refined toxoids diluted to half of the original volume, approximately 62 per cent of the nitrogen was eliminated with about a 15 per cent loss in flocculating value. By this method, the antigenic activity of a toxoid below standard may be increased to a satisfactory standard.

The antigenic activity of the refined product in the immunization of guinea pigs may in general parallel its flocculating value but the relation between the results of these tests may not be proportional nor constant. As an immunizing agent in the guinea pig, the refined product possesses an antigenic activity that is equal to, or greater than, that of the unconcentrated toxoid.—Augustus Wadsworth, James Quigley, and Gretchen R. Sickles. The Purification and Concentration of Diphtheria Toxoid, *J. Exper. Med.*, 55:815 (May), 1932.

VITAL STATISTICS

Cerebrospinal **Meningitis in 1930–1931**—The incidence of cerebrospinal meningitis has undergone some interesting changes in the course of the last few years. After the epidemic outbreak of the war years in Europe and the United States, during which the conditions of infection and of individual resistance were particularly favorable to the disease, the incidence decreased decidedly in most countries of Western Europe, until about 1922 and 1923, when it reached its lowest level. Germany was an exception; here it reached its maximum of 1,622 cases in 1922. Since then a progressive upward movement led to high points in 1929 in Austria, Belgium, Czechoslovakia, Italy, Latvia, Lithuania, Poland, and Yugoslavia. In 1930, no country reached its maximum, while 1931 was the year of highest incidence in England, Scotland and the Netherlands.

During the last 3 or 4 years, England, Egypt, Anglo-Egyptian Sudan, Northern Rhodesia, Macao, Hong-Kong, White Russia, Ukraine, have shown an annual average increase in the neighborhood of 40 per cent; the United States, Scotland, Mexico, and R. S. F. S. R. have shown moderate annual increases ranging from about 20 to 30 per cent; and Canada, Denmark, Germany, France, Switzerland, Austria, and Italy have shown increases which appear to have no definite trend and do not exceed an average of 10 per cent. Sweden, Netherlands, Poland, Hungary, Czechoslovakia, Portugal, Union of South Africa, Algeria, Japan, Shanghai, and Australia have shown decreases.

In England, the incidence of meningitis decreased after the epidemics of 1915 and 1917, with only 30 cases reported in 1923. Since then it has increased, reaching 666 cases in 1930, 2,160 in 1931 and 686 in the first quarter of 1932. The cases of the first quarter of 1932 almost equal those for the first quarter of 1912, when the highest quarterly incidence (742) on record was reported. Apart from the epidemics noted in the army (Aldershot U. D.) meningitis morbidity has been the highest in the West Riding of Yorkshire. In London, where 131 deaths were ascribed to meningococcus meningitis in 1931, the disease attacked children particularly.

In the United States, meningitis prevalence has followed approximately the same course as in England, *i.e.*, decrease after the World War until 1924 and a progressive increase since then. The new maximum, however, was reached in 1929 in the United States. The morbidity had then risen to 9 per 100,000 as against 6.4 and 7.7 for the years 1917 and 1918, respectively.

In the Union of Soviet Socialist Republics the number of reported meningitis cases has been increasing since 1923, a part of the increase being due to the improvement in reporting. Even in towns like Leningrad, only a part of the cases are notified, as shown by the fact that the number of deaths still exceeds the number of cases reported by more than 50 per cent. In this city, from 1926 to 1929, 361 deaths from meningitis as compared with 232 cases were reported.

In Egypt, after brief appearances at the end of 1908 and 1913, the disease took root in 1917 appearing each year in the form of sporadic cases of small local outbreaks. The number of cases remained fairly low until 1929, but since then it has increased rapidly, from 17 cases in 1929 to 99 in 1930 and 871 in

1931. Since the beginning of 1930, isolated cases have been notified in the provinces of Lower Egypt. After the usual summer decrease the number of cases grew rapidly from the end of November, reaching as many as 637 cases per week in the middle of March, 1932. Of the cases identified from November to March, 30 per cent occurred in Cairo alone. Sporadic cases have, in addition, been recognized in all the provinces of Upper Egypt, particularly in Minya, since the end of February.

During recent years, the Anglo-Egyptian Sudan has suffered from cerebrospinal meningitis. Epidemics in February and March, 1932, brought the number of cases, which had fallen to 4 during the last quarter of 1931, up to 418 during the first quarter of 1932. In 1930, the disease prevailed especially in the Province of Mongalla (362 cases), which had for 4 years been by far the most important focus of the disease. It also attacked the Upper Nile Province (147 cases) and the Gedaref district (233 cases).

The 1932 epidemic is spreading in Mongalla Province, Upper Nile Province and the district of Niaro Kau and Funger, in Kordofan. In Funger nearly 200 cases were notified during the week ended March 19.

Sporadic cases occurred from time to time in most of the large ports in the Far East, but their prevalence varied considerably from one port to the other. At Shanghai, the first outbreak in 1920 and 1921 (with 76 and 29 deaths for the 2 years respectively, among the resident population of the International Settlement), was followed by a period of low prevalence. Then in April, 1929, an epidemic broke out which, among the residents alone, caused 403 deaths. At Hong-Kong, the incidence of meningitis was much lower; only 24 cases were recorded there in 1931, 4 of which were imported. The number of cases began to increase at the end of March, 1932, reaching 31 with 12 deaths during the week ended April 16. Macao, the other port at the mouth of the Canton River, where 3 cases had been recorded in 1930 and none in 1931, has passed through a still more violent epidemic which occurred about a month before that at Hong-Kong. It caused no less than 362 deaths during the months of February, March, and April, a really high figure if it is taken into account that the population of the town of Macao is only about 70,000, and that of the whole territory 160,000.—*Epidemiological Report of the Health Section of the League of Nations* (Mar.–Apr.), 1932, pp. 83–89.

The Cancer Record for 1931—The death rate from cancer in American cities was just a shade lower in 1931 than it was in 1930. The death rate from this disease in this and other countries has possibly reached its maximum. The increasing practice of seeking earlier treatment and improvements in surgery and radiology are probably sufficient to arrest a further and substantial increase in the crude death rate. But the situation as it is, cannot be looked upon as otherwise than appalling.

Returns for 50 American cities since 1906 show a rise in the cancer death rate from 71.6 per 100,000 in 1906, to 100.2 in 1920, and 122.3 in 1930. During the last year under review, there was a slight decline to 121.0 per 100,000. A somewhat similar decline took place between 1911 and 1912 when the rate fell from 82.8 per 100,000 in 1911 to 80.3 in 1912. Such declines for short periods are of little practical significance.

An aggregate of 177 American cities shows that during the 2 years 1930 and 1931, the death rate from cancer changed from 117.4 per 100,000 in 1930 to 116.9 in 1931. The rate increased in 82 of these cities and declined in 95, while the range in rate was from a maximum of 215.7 per 100,000 for Madison, Wis., to a minimum of 29.7 for Ham-

tramck, Mich. These rates, of course, are affected profoundly by the admission of non-residents to local hospitals for treatment and do not clearly visualize the exact situation without an extended detailed analysis, which, however, is not possible. Out of 25 cities with cancer death rates in excess of 150 per 100,000 in 1931, 7 cities recorded rates above 170, Madison, Wis. (215.7), Concord, N. H. (195.3), Portland, Me. (194.4), San Francisco, Calif. (190.2), Troy, N. Y. (179.8), Newburgh, N. Y. (172.1), and Oak Park, Ill. (171.9).

The 1931 cancer death rates for the 5 largest cities in the United States are 133.3 for Philadelphia, 192.2 for Los Angeles, 117.6 for New York City, 111.8 for Chicago, and 69.2 for Detroit. It is shown that the actual number of deaths from cancer in these 5 cities increased from 17,326 to 17,680. By way of contrast, attention may be called to the 5 cities, which in 1931 had rates of less than 50 per 100,000. These cities were Hamtramck, Mich. (29.7), Winston-Salem, N. C. (41.6), Cicero, Ill. (47.8), Highland Park, Mich. (49.3), and Flint, Mich. (49.9).

Some of the local changes in the cancer death rates from 1930 to 1931 have been startling. Thus, in Albany, N. Y., the death rate from cancer declined from 173 per 100,000 in 1930 to 147.9 in 1931. The rate for Brockton, Mass., declined from 142.8 to 115.0, and that for Cambridge, Mass., declined from 158.3 to 129.7. A very marked decline occurred also in Holyoke, Mass., from 173.6 to 105.2. The rate for Galveston, Tex., increased from 64.0 to 113.0 and that for Greensboro, N. C., from 62.5 to 128.4. An extraordinary increase occurred in Hartford, Conn., from 99.0 to 145.9. The actual number of deaths from cancer in this city increased from 163 to 244. Another pronounced increase occurred in Hoboken, N. J., where the rate increased from 75.6 to 122.6. In Trenton, N. J., the rate increased from 119.9 to 157.4.—Frederick L. Hoffman, The Cancer Records for 1931. *Spectator*, 128: 10–13 (May 12), 1932.

Decline of the Birth Rate in France—A study that has recently been published on the vital statistics of France for 1931, points out that the birth rate fell off sharply toward the close of the year. A comparison of the birth rates for the corresponding quarters of 1930 and 1931 reveals the following differences: first quarter, increase 937; second quarter, decrease 3,537; third quarter, decrease 4,907; fourth quarter, decrease 11,155; for the entire year, decrease 18,662.

The number of marriages furthermore, having diminished by more than 16,000 it is to be feared that the reduction in the number of births may be still greater in 1932.

If one notes that, of the 730,000 births in 1931, 55,000 were of children of foreigners, whereas, of the 680,000 deaths, there were only 30,000 deaths of foreigners, it will be seen that the French excess of births over deaths in 1931 was only 25,000. This small excess runs the risk of being transformed, next year, into a permanent deficit unless something energetic is done to promote a better birth rate. Finally, since the number of emigrants in 1931 exceeded the number of immigrants by more than 25,000, the population of France has in reality diminished, the first time that that has happened since the war.—*J. A. M. A.*, 98: 2150–2151 (June 11), 1932.

How Prevalent is Syphilis?—In a recent issue of the *Weekly Bulletin* the number of cases of syphilis in New York City reported directly to the Department of Health was analyzed and the opinion was expressed that the reporting of this disease by physicians, hospitals and clinics was fairly satisfac-

tory. The data presented indicated that approximately 10 per cent of the adult population was infected. Some have thought this figure too high. Confirmation of its essential validity is contained in the Report of the New York State Health Commission which has just come to hand. According to a table in this report, showing the number of cases of syphilis reported in up-state New York 1919–1930, the total number of new cases reported during these 12 years was 145,039, the number rising from approximately 9,000 in 1919 to nearly 14,000 in 1930. In addition to this the results of 1-day censuses of cases under treatment by physicians, hospitals and clinics are shown. From these surveys it can be seen that the number of cases of syphilis under treatment at the time of the census in 1930 was 15,732. These figures, however, do not permit the calculation of an annual attack rate. In this connection the following excerpt from the Commission's report is most interesting:

> The State Department of Health, as part of its survey prevalence in 1930, collected information concerning the number of new cases diagnosed for the first time during a 1-month period. If the month (April) for which this information was secured is typical, there is indicated for up-state New York a minimum annual attack rate for syphilis of 4.4 per 1,000 of population, or 25,339 new cases of syphilis annually.
>
> The estimate as to the annual attack rate based on the number of cases presenting themselves for treatment during a particular month checks closely with similar estimates based on the known turnover of clinic patients. For up-state New York, therefore, it is estimated that at present approximately 25,000 cases of syphilis are occurring each year.

If these figures are approximately correct they would indicate that even more than 10 per cent of the adult population is infected with syphilis, for it is necessary to multiply the 25,000 new cases annually by the average number of years of life for these individuals. Assuming an average life span of 40 years for the individual, the total cases of infection would amount to 1,000,000 cases in up-state New York. This is an astounding figure. On the basis of a population of 6 million for up-state New York the figures cited indicate that an assumption of 10 per cent of the population as infected with syphilis would probably not be far from the actual facts, and that to say that 10 per cent of the adults were infected would be conservative.—New York City Dept. of Health, *Weekly Bull.*, 21: 147–148 (May 14), 1932.

Public Demands Reduction of Road Accidents in Great Britain—In spite of the new road traffic act, the appalling death toll of the roads continues without sensible diminution. In Great Britain in 1931 no fewer than 6,691 persons were killed and 202,119 injured in street accidents. Every day of the year 18 people were killed and 553 injured. The only favorable feature was that last year the number of fatal accidents was 614 less than in the previous year, but on the other hand the non-fatal accidents were increased by 24,224.

In addition to the figures given for the whole country, the following were given for London: in 1931, 1,325 persons were killed in the streets, as against 1,398 in 1930, a reduction of 5.2 per cent, as against a reduction of 8.5 per cent for the country as a whole. But closer examination revealed the startling fact that decrease of 73 in the London deaths was accounted for almost entirely by the fact that 67 fewer motor cyclists and pillion riders were killed, indicating that the motor cycle was being less used in the metropolitan area. As against the 8.5 per cent decrease in deaths throughout the country must be set the following: (1) There has been a reduction of about 3.2 per cent in the number of vehicles licensed to operate on the roads; (2) the number of per-

sons injured has increased by 13.5 per cent. The returns for London for the first 3 months of 1932 are most disquieting.

The number of persons killed has increased from 289 in the corresponding quarter of last year to 314, and the injured have increased from 9,943 to 10,865.—*J. A. M. A.*, 98: 2,000 (June 4), 1932.

PUBLIC HEALTH ENGINEERING

THE TRAVEL OF POLLUTION UNDERGROUND*

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ALTHOUGH sewage works operators and superintendents of sewers are probably not accustomed to giving much consideration to the extent to which pollution from structures which are under their control will travel underground, there are occasions when it is desirable to have a speaking acquaintance with the subject. Furthermore, the fact that sewers and sewage treatment plants in general do contribute some pollution to the soil, together with the more significant fact that under certain conditions the consequence of such pollution may be serious, makes it desirable that some attention be given to this subject. It is felt that operators should possess a knowledge of the various points about the plant where soil pollution may occur and the various possibilities, probabilities, and improbabilities.

As an example, at some sewage treatment plants water for general washing and scrubbing purposes is obtained from ground water in the vicinity of the plant. In such a case the operator should have some idea of the safety of such a supply, and to know this, unless he is willing to depend entirely upon outside advice, he must have some knowledge of whether or not pollution from any of the plant structures is possible. Many other examples could be cited which would indicate the need for the consideration of this subject by the plant operator.

Not infrequently, a neighboring resident will complain that a private well is receiving contamination from either the plant or seepage from the outlet water course, and in such cases it is advantageous to the operator to be so well informed that he can talk convincingly about the matter. In maintaining supervision of public water supplies we are accustomed to place the burden of detecting and eliminating sources of pollution upon the water works superintendent or operator. But usually the water works superintendent will not have the knowledge relative to the peculiarities of the sewerage system that is possessed by the superintendent of sewers. There is therefore an opportunity for the superintendent of sewers to contribute something to the protection of the public water supply. Although it is the responsibility of the water works superintendent or operator to know what possible sources of pollution may be contributed to the water supply, there is need also for the sewer-

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age works operator or superintendent of sewers to know definitely that there is nothing about the sewerage system or treatment works which can be regarded as a source of pollution of the public water supply. It is believed that the sewage works operator should know at all times the definite points at which pollution may be contributed to the soil by the various units of the plant and know also the possible or probable effects of such soil pollution as may be contributed by the various units of the plant.

Among the several points at which pollution of the soil may occur we might enumerate the following:

1. Leaks in sewers which permit the contamination of the immediate surrounding soil with dangerous pollution. Ordinarily from the sewage works operators' standpoint a leak in a sewer is objectionable because of the possibility of admitting large quantities of ground water. However, there are situations occasionally in which the leakage from the sewer into the surrounding soil becomes the major consideration. We need to keep in mind that in municipalities maintaining both sewer and water systems, there is an intricate network of underground pipes which cross and recross each other. In some instances there is need for concern about the sewer which crosses the water main; for example, when due to peculiar hydraulic conditions a negative head may at times exist in the water mains, thus permitting contamination of the water main by leakage from the sewer.

Such a situation arose in one municipality in this state. Sewers and water mains were laid some 35 years ago and for purposes of economy were placed side by side in the same trench. Due to peculiar hydraulic conditions there developed at times a negative head in one section of a water main located in the higher portion of the village. It happened also that a typhoid carrier lived on the street in question, and his place of residence was connected with the sewer that was embedded in the trench along with the water main. Several cases of typhoid fever developed along the street and later investigation disclosed that some of these cases probably arose by reason of the contamination of the water main with sewage from the sewer which paralleled it. It is possible in this case that had the village been served by either a water works superintendent or superintendent of sewers who fully appreciated the significance of all the various factors involved, improvements would have been made long ago which would have prevented the outbreak.

Another example of the serious conditions that are sometimes created by leaks in sewers is furnished by the experience of a certain city in the middle west some five or six years ago. The city water supply, obtained from a group of wells, was collected in a receiving reservoir across the street from the wells. Water was piped across the street through a tile line which crossed a sewer line 2 feet above it. The sewer became clogged at a point about 400 ft. below the pipe crossing, causing it to become surcharged at its intersection with the water line, and resulting in the serious contamination of the entire city water supply. About 3,000 cases of dysentery developed. The services of an efficient superintendent of water works or of sewers who fully appreciated the dangerousness of the situation might have precluded this trouble.

2. Leaks from plant structures such as wet wells, tanks, etc.—Although generally watertight construction is secured, it is nevertheless possible for leaks to develop. Whether such leaks are serious depends, of course, on local circumstances. Recently the Commissioner of Health felt obligated to refuse to approve the location of two proposed sewage treatment plants because they were too close to the wells serving as a source of water supply for the respective communities.

3. Drainage from sludge beds or intermittent sand filters that seeps into ground strata below the level of the underdrains—I know of one instance where a private well was apparently affected by such seepage.

There has always existed a difference of opinion in regard to the distance to which pollution will travel underground. About 1923, the U. S. Public Health Service undertook a series of elaborate experiments at Fort Caswell, N. C., and some other places to secure authoritative data on the subject. The results are published in *Hygienic Laboratory Bulletin No. 147*. In brief, the Fort Caswell experiments included the construction of shallow pits in sand in which excreta and cow manure and uranin dye were placed. Numerous sterilized wells were then sunk in different directions and at varying distances from the experimental trench,

and frequent samples collected from the various test wells to determine the extent to which underground pollution had progressed. It will probably be of interest to review briefly the condensed conclusions contained in this report.

1. Bacteria pollution as determined by the test for *B. coli* was demonstrated in 1,213 samples of water taken at distances varying from 1 to 232 ft. from the experimental trench.

2. Chemical pollution as determined by the test for uranin dye was demonstrated in the ground water at distances up to 450 ft. from the experimental trench.

3. Both the dye and the *B. coli* travelled only in one direction, namely in the direction of ground water flow.

4. Neither the dye nor *B. coli* was found in other portions of the experimental field.

5. Wet weather resulting in high ground water was found to be conducive to the extension of pollution.

6. Dry weather resulting in low ground water was found to be inhibitive to the extension of pollution, and conducive to the purification of the ground water.

7. The tendency was demonstrated for *B. coli* to localize in the upper blanket at or near the ground water table, and water samples in a given well from this blanket were found to show heavy *B. coli* pollution, while water samples a few inches lower were found to be generally *B. coli* negative.

8. It was found that when the ground water falls, the *B. coli* tend to filter out into the capillary fringe or, in case of a further fall, into the soil and that if the soil remains dry sufficiently long the *B. coli* die out.

9. It was found also that the uranin dye tended to float out in a blanket at or parallel and close to the ground water table, and to filter out upon the fall of the ground water into the capillary fringe and soil, but did not always seem to rise with higher ground water.

10. The investigation demonstrated also that the experimental infection of the ground water remained alive for more than 2 years and 8 months and that uranin dye was recoverable from the ground water for a similar period of time.

11. The investigation brought out also the fact that as pollution travelled it did not appear to expand laterally in a fan shape but on the contrary to contract into a narrow band.

The report brings out admirably the fact that the distance to which pollution can extend depends upon a number of factors, including rate of ground water flow, the pH of the soil, geological formations, bacterial competition, available food supply, bacterial mortality, rise and fall of the ground water dependent upon the weather, etc.

Where sewage works are constructed on limestone formations or sewers are laid in creviced rock the opportunities for serious contamination of the ground water are much greater than when the structures are built upon sands or clays. There was one instance where a subdivision of a city was to be served by an Imhoff tank with the effluent discharging into a limestone sink hole, situated about 2 miles from the Mississippi River. Fluorescein dye placed in the sink hole appeared in the river about 48 hours after its introduction and about 100 ft. above the water works intake. Naturally the plant was never constructed.

In another case a small village obtained its water supply from deep wells penetrating limestone and located in the high section of the village. The sewage treatment plant was located on the opposite side of the village and in the low section. The effluent from the tank was discharged to a small water course strewn with rock and most of the effluent seeped away. Shortly after the sewage plant was placed in operation the wells developed contamination. An investigation disclosed that the rock strata were inclined at reverse angles to surface slopes and that the effluent from the sewage works was contaminating the wells.

I want to close with a brief recital of an experience recently encountered at Rockville Centre. That village is served by a sewage treatment plant of the activated sludge type and the effluent is discharged onto percolation beds whence it seeps into the ground waters tributary to a small creek. Residences are situated down stream along this creek, and in one particular case the water is used for watering vegetables,

lawns, etc. For some time the residents in the vicinity of the plant complained about the high condition of ground water and the fact that in some private wells the water showed the effects of contamination as reflected by high chloride values.

In April of this year some of the residents along Parsonage Creek below the plant brought an action in the New York Supreme Court, County of Nassau, against the village of Rockville Centre, the principal allegation in which was as follows:

> The filter beds are constructed and maintained in such manner that waters therefrom seep into and enter the headwaters of the said Parsonage Creek, carrying with them harmful bacteria and other matters and substances which contaminate and pollute the waters of said Parsonage Creek, rendering them unfit for use and dangerous to the health of the plaintiff and other residents along the course of said Parsonage Creek.

The village officials confronted with a lawsuit of this nature naturally developed a keen interest in the subject of the distance to which pollution will travel underground. Normally the sewage effluent produced at Rockville Centre is discharged onto the surface of one or more of the percolation beds located within the plant grounds, and the effluent then percolates into the natural sand and gravel deposits upon which the beds are constructed, and enters the ground water tributary to Parsonage Creek. There was no reason to deny therefore that seepage from the percolation beds reached Parsonage Creek. It was known also that a sewage effluent produced by the activated sludge process under proper operating conditions is in general terms practically clear, stable, non-putrescible, low in oxygen demand and with a changed and reduced bacteria content so that it may be safely applied to percolation beds or discharged to surface waters without the creation of offensive conditions.

As I have indicated previously there is considerable literature on the subject which tends to show that polluted waters in travelling a short distance through sand become purified by reason of the natural purification processes established in the soil. In the case of Rockville Centre, then, it could reasonably be expected that whatever bacteria were contained in the effluent as applied to the percolation beds would be completely removed in the first 200 or 300 ft. of travel of the seepage through the soil and that any organic matter contained in the effluent would eventually become completely oxidized. On general principles, considering the distance between the percolation beds and Parsonage Creek (more than 1,400 ft.), it was felt that serious contamination of creek waters could not result from the method of sewage disposal now employed by that village.

It was concluded that whether or not such contamination of creek waters did take place could be demonstrated only by definitely locating the underground path of seepage from the percolation beds between those beds and the creek, and the collection therefrom of samples of water for bacteriological examinations; and that if samples of water collected from the underground seepage from the percolation beds showed no bacterial contamination it was then safe to conclude that harmful bacterial contamination of creek waters does not result from seepage from the beds. This was the general procedure followed during the investigation.

Chlorides, being a harmless inert mineral constituent of sewage, undergoes no change during the process of sewage treatment. The chloride value of the effluent could be expected to be the same as in the original sewage although there is considerable fluctuation in the amount present at different times. In general, chloride would be high in sewage or sewage effluent and low in normal surface or superficial

TABLE I

	Well No.				
	1	*2*	*3*	*4*	*5*
Distance from percolation beds—feet	400	800	1,000	1,300	1,400
20° Bacteria per c.c.	liquefied	2	17	10	2
37° Bacteria per c.c.	0	1	2	0	0
Test for *B. coli* group					
In 10 c.c.	0+3—	0+3—	0+3—	0+3—	0+3—
In 1 c.c.	0+3—	0+3—	0+3—	0+3—	0+3—
In 0.1 c.c.	0+3—	0+3—	0+3—	0+3—	0+3—

ground water. This phenomenon would make it possible to locate with certainty the underground seepage from the percolation beds.

Forty-two borings were made at and in the vicinity of the sewage treatment plant site. Most of these were made with a hand auger to a maximum depth of about 10 ft. In some cases it was not possible to reach ground water with the equipment available, and in other cases ground water was reached a short distance below the surface. Following this method and running an elaborate series of tests for chlorides, the path of underground seepage from the percolation beds was definitely ascertained to be from 50 to 100 ft. wide, although the area of the percolation beds occupied about 6 acres. To obtain samples for chemical and bacteriological analysis, 5 driven wells were sunk into the ground water strata in the line of seepage from beds at varying distances below the beds.

A sample of sewage effluent taken from one of the percolation beds gave among other things the following results (in p.p.m.): Free ammonia 12.5, albuminoid ammonia 0.154, nitrites 0.020, nitrates 0.04, total organic nitrogen 7.14, oxygen consumed 10.0, chlorides 38.0 and *B. coli* present in all of the 0.001 c.c. volumes tested.

Samples collected from the 5 driven wells, tapping the underground path of seepage from the beds gave the results shown in Table I.

Well No. 5 located about 1,400 ft. from the percolation bed tapped the underground stream of seepage about 100 ft. above the point where a spring fed from the seepage issued into Parsonage Creek. The chemical results on this sample are given in Table II.

TABLE II

Determination	*p.p.m.*
Free Ammonia	6.0
Albuminoid Ammonia	0.04
Nitrites	0.04
Nitrates	10.0
Total Organic Nitrogen	1.39
Oxygen Consumed	1.8
Chlorides	33.0

In comparing the results of the chemical analysis of a sample of the sewage effluent with the results for the sample collected from the seepage after passage through 1,400 ft. of sand it will be noted that free ammonia dropped from 12.5 to 6.0 p.p.m.; nitrates increased from 0.04 to 10.0 p.p.m.; total organic nitrogen decreased from 7.14 to 1.39; oxygen consumed decreased from 10.0 to 1.8; and chlorides were practically the same.

The investigation brought out clearly that while seepage from the percolation beds did reach the creek at points about 1,400 and more ft. distant from the percolation beds, and the flow in the creek was composed largely of former seepage from the beds, such seepage as it entered the creek did not contain dangerous contamination as indicated by the results of the bacteriological examinations made upon samples collected from the underground path of seepage. This finding, of course, was in line with prior reasoning. The fact that no *B. coli* and very low bacterial counts were found in

the sample collected from the first well located about 400 ft. below the beds would indicate that all bacterial pollution is strained out in a comparatively short distance of travel through the sand.

The results that occasioned some surprise were the nitrate and free ammonia values of the effluent as applied to the beds and the free ammonia results in the seepage as it entered Parsonage Creek. It was to be expected that the seepage would contain high nitrates, but it was thought also that the effluent from the sewage works would be highly nitrified. As a matter of fact, the sewage effluent was found to be practically devoid of nitrates but high in free ammonia, and the high nitrates in the seepage were due entirely to the nitrification accomplished in the travel of the seepage through the soil.

The fact that high free ammonia prevailed in the seepage at a point 1,400 ft. from the beds brings up an interesting point. It demonstrates at least that chemical pollution can be carried for a long distance through fine sand even when the rate of ground water flow is fairly slow. In this particular case the nitrates were reduced greatly after the seepage issued into the creek and were largely consumed by prolific growths of algae that occurred in the upper reaches of the stream. The free ammonia, however, continued to persist down stream and there was a gradual increase in nitrate values with a corresponding decrease in free ammonia values. The nitrate value of the stream at the point where seepage entered it was 0.5 p.p.m. and the free ammonia value was over 3 p.p.m., while samples collected from the creek about ½ mile down stream contained 2.1 p.p.m. nitrates and only 0.14 p.p.m. of free ammonia. The fact that free ammonia was carried in the seepage for a long distance through the soil is therefore regarded as having the effect of increasing the nitrate values in the lower reaches of the stream and consequently contributing to algae production there that would otherwise not have occurred. If no free ammonia had been carried in the seepage it is very probable that high nitrate values would not have prevailed in the creek waters except in the very uppermost reaches of the stream where conditions were exceptionally favorable for algae production and nitrate consumption.

And in this particular case there is some reason to want the nitrate values reduced, as the water enters a pond on the estate of one of the complaining property owners about ½ mile below the headwaters of the creek.

How far will pollution travel underground? From the Fort Caswell experiments the answer is that bacterial contamination may travel as far as 232 ft. through fine sand and that chemical pollution as indicated by the uranin dye tests may travel as far as 450 ft. From the experience at Rockville Centre the answer is that bacterial contamination will be removed in a relatively short distance of travel through fine sand but that chemical pollution as indicated by free ammonia tests does travel through fine sand for distances considerably in excess of 1,400 ft.

INDUSTRIAL HYGIENE

Annual Report of the Chief Inspector of Factories and Workshops for the Year 1931 (Great Britain)—Topics of special interest to the industrial hygienist include: Explosions, manufacture and use of cellulose lacquers, gassing (especially the description of the deaths of five workmen from anoxemia in a caisson head), the dangerous trades—asbestos, celluloid, cinematograph films, chromium plating, grinding of metals, potteries and refractory materials, and the hygiene of lighting and ventilation. A section on welfare refers to fish-curing, tanning, sugar factories, and cement. A section is devoted to the Home Office Industrial Museum, exhibits, and a conference of directors of foreign industrial museums. Especial interest attaches to the report by Dr. John C. Bridge, Senior Medical Inspector of Factories.

On the whole, the health of women and young persons has been generally satisfactory. The rate of sickness for "nervous disability" shows a tendency to rise. Vastly more days are lost from vague ill-defined disability due to *ennui* than from all the recognized industrial diseases together. This is a pressing problem in industrial health at the present time. No doubt, in the monotonous, repetitive processes of the machine age, the uninterested worker is an industrial invalid.

There was a marked decrease in lead poisoning (168 cases as compared to 265 in the preceding year). Chronic nephritis and cerebral hemorrhage were noted, likewise the confusing of lead poisoning with certain types of acute appendicitis. In potteries, fatal cases were high as compared to non-fatal, but they have been of long standing, not acute. Shot-blasting for removing (lead) enamel from bath tubs produced cases. In the painting of buildings, dry rubbing down would appear to be the cause of the poisoning (waterproof sandpaper is suggested as the preventive).

Mercurial poisoning occurred in 3 repairers of electric meters, 2 who were using mercury as a catalytic agent and 1 in making thermometers. Five cases of carbon bisulphide poisoning were reported, none serious—4 in the treatment of acetate of cellulose by carbon bisulphide and 1 in the manufacture of the latter.

There were 30 cases under anilin poisoning: Making intermediates (D.N.B., D.N.T., T.N.T.) 10, making or use of anilin 8, making anilin colors, etc., 6, anilin black dyeing 3, 5-chlor-orthotoluidine 1, removing ink stains from linen 1, arseno-benzol process 1. The most frequent cause was absorption through the skin, as following splashing.

One case of chronic benzol poisoning was reported in a man who had worked with the substance for 38 years, and 8 years as superintendent with only slight exposure. The onset of ill-health was sudden. Following extraction of teeth the subject went downhill rapidly and died within a few months. Had there been no exposure to benzol, the diagnosis would probably have been agranulocytic angina. The symptoms noted among a small group of leather dressers were probably due to benzol.

There were 7 cases (2 fatal) due to arseniuretted hydrogen. Six of these (2 fatal) arose in the damping down of dross containing arsenides.

The number of notified cases of anthrax was 21 with 4 deaths as compared with 43 cases and 6 deaths in the previous year. One of the fatal cases was internal anthrax. During the past

32 years there had been reported 315 cases with 69 deaths.

There were 65 cases of chrome ulceration, 41 of which occurred in plating, 8 in dyeing and finishing, 3 in tanning, 2 in the manufacture of bichromate, and 11 in other industries. In one man, ulceration involved the nose, larynx, and vocal cords. Another suffered a severe ulceration of the scrotum due to chromic acid splashed on his apron. The Official Cautionary Chrome Placard should be followed and precautions have not been exaggerated nor made too stringent.

Epitheliomatous ulceration was reported in 156 cases with 46 deaths, compared to 194 with 36 deaths the preceding year. Of those of 1931, 41 occurred in connection with pitch (2 fatal), 35 with tar (13 fatal), 2 with paraffin and 78 with oil (31 fatal). The tar and pitch group showed 29 (2 fatal) in connection with patent fuel works; 15 (1 fatal) with tar distilling; 14 (8 fatal) in gas works; and 18 (4 fatal) in other industries. The oil cases were chiefly in connection with cotton mule spinning, 60 cases (19 fatal). Quarterly periodical medical examinations have now been instituted by the Tar Distillers' Association. The total of recorded cases among cotton mule spinners is now 1,062, including 867 who were still employed when the disease was first recognized, 52 who had retired from 1 to 16 years, and 143 in ex-spinners who had passed into other employment.

Eight cases of carcinoma of the bladder were reported, 5 of whom were employed in the manufacture of synthetic dyes, all coming into contact with *a*- or *b*-naphthylamine (a list is given of other benzine derivatives to which some were exposed).

The 666 reported cases of dermatitis show a decrease (last year, 789). The use of alkaline antiseptic wash (Liq. Chlorinated Soda with boric acid, B.P.C.) has proved its value in connection with oil dermatitis. Ointments have proved effective in that due to chromic acid, turpentine and its substitutes. Alkalies, especially soda and lime, are the chief causative agents of dermatitis, especially when used as cleansing agents. About ⅓ of the reported cases of dermatitis were recurrent.

The Registrar General received 785 certificates of deaths from fibrosis of the lungs. Of these, 319 were silicosis (compared to 241 last year): Pottery 57, sandstone 69 (quarrymen 23, stone masons 46), coal mining 47, grinding 36, gold mining (ex-South African miners) 26, tin mining 17, ore mining 9, other mining 10, refractories (silica brick, etc.) 19, sandblasting 17, steel dressing and cleaning of castings 4, slate quarrying 3, flint and sand crushing 3, granite 1, scouring powders 1. In addition, 9 deaths were attributed to asbestos (with or without tuberculosis). Full particulars are now available of 35 deaths from asbestosis, or asbestosis with tuberculosis. The duration of exposure with these shows half the length of years as in the case of silicosis. Steel shot is gradually replacing sand in abrasive cleaning. Special regulations have been prepared for the asbestos industry (*Form 939*, Feb., 1932, price 1d. net).

Acetone was not demonstrated to be the cause of headache, nose bleed, jaundice, or secondary anemia in various ones among 10 women who complained of the fumes. Two cases of nicotine poisoning occurred from the bursting of a pipe, the hazard being absorption through the skin.

Dr. Horner made an examination of 133 operatives employed from 1 month to 8 years, 26 of whom came in contact with cellulose solutions as brushers, dressers or dippers, and 107 as sprayers of cellulose paint or lacquers. Both males and females were represented. It seems evident that: (1) there is a definite relation between conditions of ventilation and signs or symptoms of ill

health; (2) there is no apparent injury to health where xylol has been the diluent; and (3) local irritation of mucous membranes with headache, depression and fatigue, not amounting to disability, are frequently recorded, especially when ventilation is inadequate. (The report contains much more information.)—Home Department, H. M. Stationery Office, London (Obtainable from British Library of Information, 270 Madison Ave., New York, Cmd. 4098, price 70¢), 1932, 155 pp. E. R. H.

A Medical Program for 10,000 Employees and Their Families—Medical service in industry is evaluated in terms of major economics—the ability to recognize value of so-called intangibles, and to convert them into material values—and minor economics which are more readily reduced to a monetary value.

It is possible to have in smaller plants a well designed and effective medical program based on fundamental accepted practice. To operate a medical department successfully in any company requires (1) money, (2) medical personnel, particularly qualified in industrial medicine, (3) a definite objective and program, and (4) the wholehearted support of the executives of the company.

Probably the oldest form of health insurance exists in the mining industry. In many localities it is possible for a married man and his family to obtain complete medical care and hospitalization for the sum of $40 per year.

In the Consolidation Coal Company the employee contributes directly while the company pays its share of the cost by defraying the expense of the Health and Preventive Medicine Program carried on in the various coal mining communities. There are approximately 10,000 employees who, with their families, compose a population group of from 30,000 to 35,000 persons, scattered over a wide area.

The objective of the program is:

> . . . the treatment and care of sick and injured employees and their families, the application of hygiene, sanitation and education with the objective in view of preventing illness and keeping the employees of our communities in good health.

The personnel of the medical department consists of 22 full-time physicians, 12 public health nurses, several dentists, and a 50-bed accredited hospital. Special arrangements to care for the employee and his family are also made with private hospitals, institutions and consultants. To cover the wide area the organization is divided into medical units, each of which is practically self-sufficient.

Last year 163,024 persons (employees and members of their families) received medical attention. Of these 42,678 were visited in their homes. Some 80–85 per cent of these cases were minor illnesses, for the most part preventable. Experience from these is used for establishing preventive measures.

Every applicant for employment is given a thorough physical inspection, and if accepted, his entire family enters the health régime of the company which includes visits of the public health nurse and doctor, instruction in hygiene and sanitation, promotion of immunization, etc.

Typhoid, smallpox, and diphtheria were quite common several years ago but are now exceedingly rare. Close to 100,000 individual doses of typhoid vaccine and approximately 32,000 smallpox vaccinations were given in the past 3 years.

Strict attention is given to water supply and milk control. A local inspection committee consists of a public health nurse, a physician, and 2 or 3 local health officials who make periodic examinations including all houses, public buildings, stores, restaurants, schools, etc. Considerable improvement has followed this régime. Approximately 350

food handlers have been examined, 10 per cent of whom were found to be carriers of infectious and contagious diseases.

Organized school health supervision is promoted as well as clinics for infants, young children, expectant mothers and for suspected cases of tuberculosis. Other activities concern the development of community groups such as scout, civic, farm women, and church clubs; also fire prevention and dispensing of material relief. Monthly staff meetings are held in the various centers. The plan was inaugurated about 5 years ago.

. . . the amount and character of illness and death varies in direct proportion to the effectiveness of our preventive program. In other words, death, sickness and ill-health decrease as progress is made in prevention.—D. J. Kindel, Medical Director, The Consolidation Coal Co., Fairmount, W. Va., *Executives Service Bull.*, 10, 7: 7–8 (July), 1932. E. R. H.

Death of a Leader in Industrial Hygiene: Sir Thomas M. Legge—Readers of this section should review the obituary by Charles Porter, M.D., in the July issue, 1932, of this JOURNAL (p. 735). Reference is also made to the more extensive memorials in the *Journal of Industrial Hygiene*, June, 1932 (pp. 235–236), and *The Lancet* (London), for May 14, 1932 (pp. 1069–1070), the latter of which carries a portrait of the deceased. A number of the members of our Association will also remember Dr. Legge's visit to some of the eastern states of this country several years ago.

His principal works were *Lead Poisoning and Lead Absorption*, with Sir Kenneth Goadby, his translation into English of Rambousek's *Industrial Poisons*, his *Shaw lectures*, and *Milroy lectures*. He held the post of Chief Medical Inspector of Factories and Workshops (England and Wales) for nearly 30 years, and died May 7, in the 70th year of his life. The annual reports of his office have been rich sources of information for many years. His loss to industrial hygienists will be as greatly felt in America as in his home country.

He is survived by his widow, two sons and a daughter. E. R. H.

Mortality Experience of International Typographical Union, 1931—This mortality experience is presented by Dr. Hoffman in the form of death rates per 100,000. The year 1931 showed a slight advance in the general death rate over the year 1930, and there appeared to be an increase in death rate due to pulmonary tuberculosis, cancer, diabetes, pernicious anemia, pneumonia and hernia. On the other hand there was a decrease in nephritis, cirrhosis of the liver, gastric ulcer and appendicitis. There was a decrease in the death rate due to cerebral hemorrhage, general paralysis, paralysis of the insane and angina pectoris. Other cardiac diseases, embolism and thrombosis showed an increase in the death rate.

The reader is referred to the original article for the statistical tables which cannot be quoted here.—Frederick L. Hoffman, *Month. Labor Rev.*, 34, 6: 1310–1312 (June), 1932. L. G.

Results of Supplementing the Dietary of Substandard Workers with Cod Liver Oil and Milk—Sixty-three underweight young women engaged at tasks classified as light muscular activity were provided with a supplement of cod liver oil and milk to their usual home diet. Weekly records of body weight and efficiency rating were made.

Of 45 young women included in a full year's test, the average increase in body weight was 2.6 lb. There was a decrease in absences and an increase in efficiency rating. In a 2-year test all but 3 of 18 young women gained in weight each year, the average gain being

4.5 lb. during the first and 1 lb. during the second year. The average number of absences in a period from December to May showed a reduction of 61 per cent in the 2-year tests. The efficiency increased from an initial of 77.8 per cent to 80.1 per cent for the second year.—W. A. Sawyer and Laura Comstock—*J. Indus. Hyg.*, 14, 6: 207–215 (June), 1932. L. G.

Decomposition of Dichlorodifluoromethane by Flames—Dichlorodifluoromethane ($C Cl_2 F_2$), often referred to as F–12 or Kinetic–12 has recently come into use as a refrigerant gas in household refrigerators.

The properties of this gas were studied by the Underwriters' Laboratories and the laboratories of the United States Bureau of Mines, and it was found to be a stable, non-irritating and non-toxic gas by these investigators.

It has, however, been suggested that this gas, when acted upon by flames, may be decomposed with the formation of hydrofluoric acid.

The authors of the present paper by means of a series of computations which are in fair agreement with actual tests conducted by them demonstrated to their satisfaction that no danger can occur due to the leakage of dichlorodifluoromethane subsequently coming in contact with gas flames. The authors conclude that dichlorodifluoromethane does not create a health hazard under these conditions.—Thomas Midgley, Jr., and Albert L. Henne—*J. Indus. & Eng. Chem.*, 24, 6 (June), 1932. L. G.

Carbon Monoxide Distribution in Relation to the Ventilation of a One-Floor Garage—This study was designed to determine the concentration of carbon monoxide in a one-story garage in a city in Pennsylvania. The garage studied was 60′ x 52′ with a ceiling height of 11′ 8″, it originally possessed no mechanical ventilation, but windows were provided on three sides of the room. For the purposes of study mechanical ventilation was provided in the form of 6 15″ propeller fans located at points on the long sides of the building. Eight surveys were made of the carbon monoxide content of the air of this garage with varying numbers of cars idling. The pyrotannic acid method was used for carbon monoxide determinations.

It was found as a result of this study that upward ventilation yielded the lowest carbon monoxide concentrations in the air, downward ventilation yielded slightly higher results. Cross ventilation and gravity ventilation through the fans and windows occupied an intermediate position, and finally no ventilation and gravity ventilation through fans alone, yielded the highest concentrations of this toxic gas.—F. C. Houghten and Paul McDermott—*Heating, Piping & Air Conditioning*, 4, 7: 495–501 (July), 1932. L. G.

Medical and Hospital Problems of Workmen's Compensation in New York—The Governor of the State of New York appointed a Committee charged with the duty of reviewing medical and hospital problems in connection with workmen's compensation insurance. On February 29, 1932, the report of the committee was transmitted to the Legislature by the Governor. The findings of the committee are of great interest and are presented herewith in some detail, since they may be found to be applicable to the functioning of the compensation laws in many other states of the Union.

In connection with hospital problems the committee found that the sums paid to charitable hospitals are in general less than the actual cost to the institutions, and it consequently recommended an amendment to the law providing that charitable or municipal hospitals be entitled to charge the reasonable cost of the services rendered without regard to ward-charity rates established by them.

The committee also recommended a change in the law on authorization of treatment, so that lack of authorization by employers or carriers in cases treated by municipal or charitable hospitals shall not prevent collection of payment for services; the enactment of a lien law in third-party suits similar to that in force in New Jersey; and provisions to insure payment for hospital services in other cases.

In regard to medical problems, the committee recommended the passage of the bill presented to the legislature by the department of labor, extending the scope of the compensation act to cover all occupational diseases. It is contended that the specific schedule, like that existing in New York, does not solve the problem, and as the average cost of covering all diseases in 10 other states is only about 1 per cent of the total compensation cost, the additional cost of the all-inclusive coverage should be only a small fraction of 1 per cent in New York, where 27 occupational diseases are already covered.

The committee suggested that insurance-company doctors be excluded from the room when the claimant is being examined by a state physician, to avoid any suspicion of bias or influence. It also recommended that "lifting" of cases (*i.e.* transfer of patient to other medical or hospital services by means of threat, suggestion or consideration from an insurance carrier) be prohibited under penalty.

The committee found unsatisfactory the practice of having the medical records supplied by agents of insurance companies, and recommended that these records be supplied by a disinterested party. It also suggested a fundamental change in the law, establishing a series of clinics under the supervision and direction of the state.

While present methods are not wholly satisfactory, the committee did not favor the free choice of physicians by patients, but suggested that some method be devised for rating physicians desirous of doing compensation work. It recommended that the subject be referred to the state board of regents.

Increases were recommended in both the professional personnel and the clerical staff of the department, as well as higher salaries for certain members of the latter.

Total disability, in the opinion of the committee, should be interpreted to mean that a man is unable to return to the occupation in which he was engaged when he was injured and should be compensated until he can resume that work. If he earns something at light work in the meantime, that amount should be deducted from the compensation due.

The committee was of the opinion that certain baffling and highly specialized medical problems can best be solved by a group of unbiased experts, and suggested the creation of a supreme court of review on medical questions, drawn from a panel of 75 men and to be used by either party for decisions on a purely medical matter; questions would be submitted to three or five of this body, both sides being bound by the decision.

As to departmental procedure the committee recommend an amendment to the act, relating to appeals; the establishment of a bureau for medical examination of claimants; provision of suitable examination rooms in the different cities or communities, or the use of automotive equipment with adequate facilities; and some changes in the law whereby a man injured while working for an uninsured employer will not become a burden to society because of the failure of his employer to comply with the law.

Bills appended to the committee's report cover the presence of insurance company doctors at examinations, authorization for medical or hospital treatment, reasonable charges by hospitals, and definition of charitable and municipal hospitals.

A special memorandum, endorsed by the majority of the committee, but not by the committee of the whole, expresses disapproval of the practice of insurance companies maintaining and operating clinics.—

Month. Labor Rev., 35, 1: 92–93 (July), 1932. L. G.

Health Promotion in the Bell Telephone System—It is the object of the personnel policy of the Bell System to bring out and develop the best quality in each employee and to weld that into effective coöperation in the business. The system comprises 24 operating companies, among them the Western Electric Company, etc. Excluding the Western Electric Company, the Bell Telephone Laboratories and the Bell Telephone Company of Canada, the total number of employees as of December 31, 1930, was 328,956, of whom 203,805 were women and 125,151 were men.

Especial emphasis is placed on the working conditions for women. To carry out the work which they do re-

quires a high type of employee. While tuberculosis or ill defined nervous disorders arise, there is apparently no health hazard from the standpoint of either disease or accident that is characteristic of the telephone industry.

The day is divided into 3 periods of 8 hours each. As a rule at least 1 hour is given for luncheon and rest, and additional rest periods of 15 minutes are allowed mid-forenoon and mid-afternoon. Much attention has been given to adequate seating and proper posture, also to ventilation and temperature regulation and lighting as well as to rest rooms, locker rooms, etc. These conditions are reflected in the homes of the employees. Many of the central offices provide rubbers and umbrellas which may be borrowed in emergencies—a provision of definite value as a preventive measure.

Cafeterias are usually provided and food-handlers are examined periodically. Lessons are given in diet, nutrition and health which have no doubt increased the demand for milk and green vegetables and decreased the consumption of sweets. Many of the companies provide various forms of recreation such as hiking, swimming, and bowling.

Absence from work on account of sickness is divided into two parts: (1) incidental or short-term absence, and (2) absence of more than 7 days. The latter have been recorded and analyzed in a standardized manner since 1913. There is a benefit and medical department. The requirements for physical examinations vary, depending on local conditions and policies but such are emphasized and encouraged, particularly for executives and older employees. Usual medical attention is referred to private physicians.

All general health activities are under the operating department with the cooperation of the medical department, which latter therefore assumes no direct responsibility.

The voluntary health course has been in operation for 6 years, with approximately 140,000 graduates. Some 3,600 have taken the nutrition course, and more than 75,000 have received a course in safety instruction (chiefly men).—Leverett D. Bristol, *Hygeia*, 10, 5: 438–441, illustrated (May), 1932.

E. R. H.

Annual Report of the Rockefeller Foundation, 1930—The following items of interest to industrial hygienists are found in this volume: Appropriations made during 1930 in connection with the program for industrial hazards and economic stabilization (pp. 220–227) totaled $980,000, of which $875,000 were made to Harvard University, Boston; $50,000 to the President's Conference on Unemployment, Washington, D. C.; $15,000 to the National Institute of Public Administration, New York City; $20,000 to the National Institute of Industrial Psychology, London, England; and $20,000 to the Austrian Institute for Trade Cycle Research, Vienna.

The program at Harvard has now been extended to cover a variety of forms of hazards in industry, including accident and disease. A university committee in which the School of Public Health, the Medical School, the Engineering School, and certain departments of Harvard College, as well as the Business School, are represented, has supervisory charge of the program. The appropriation made by the Foundation in 1930 provided necessary funds over a 7-year period. (See also pages 278 and 284.)—The Rockefeller Foundation, 61 Broadway, New York, N. Y.

E. R. H.

FOOD AND NUTRITION

The Vitamin D Content of the Fat of Sea Perch, Porpoise and Seal—The visceral fat of the sea perch (*Sebastes marinus*) and the subcutaneous fat of the porpoise (*Delphinapterus Leucas L.*) and the seal (*Erignathus barbatus M.*) were examined both chemically and biologically. The acid value was least in the seal fat (0.91) and highest in the porpoise fat (9.30). The prophylactic method was employed and the experiment lasted for 3 weeks and the degree of rachitogenic effect determined by roentgenograms. By this method 1 gm. of the sea perch fat contained 100 to 150 vitamin D units and that of the porpoise less than 50 units. The fat of the seal was found to contain practically no measurable amount of vitamin D. It was concluded that the content of vitamin D in the intestinal fat of the sea perch was equivalent to the fat of the cod.—S. N. Matzko and D. A. Vital, *Ztschr. f. Unter der Lebens*, 5: 495 (May), 1932.

The Reducing Power of Vegetable Food Material and Its Relation to Vitamin C; V. The Antiscorbutic Effect of Various Extracts of Cucumber—Extracts of fresh cucumber were prepared with cold water and with diluted sulphuric acid and these extracts were fed to guinea pigs in varying amounts. At the end of the 63-day experiment, all of the animals, with one exception, on the water extract and the sulphuric acid extract were normal, comparable to the controls receiving 1 c.c. citrus juice daily. In the controls receiving only the basic diet all developed scurvy. The amount of reducing substances present was determined by titration and found to parallel the antiscorbutic potency of the extracts. The reducing substance in these extracts succumbs to oxidation by atmospheric oxygen more readily than the reducing substance in citrus juice. The investigation of reducing substance in fruit and vegetable material is described (3: 241) by these authors in the same journal.—*Ztschr. f. Unter der Lebens*, 3: 276 (Mar.), 1932.

A Case of Food Poisoning Apparently Due to Staphylococcus—Chicken gravy, prepared on Tuesday from left over bits of chicken originally served on the preceding Sunday, when eaten at the evening meal on Wednesday produced violent vomiting, purging and prostration. The chicken when served on Sunday caused no illness.

Laboratory examination of the gravy disclosed no bacteria of the Salmonella group. Large numbers of staphylococcus colonies resembling those of *S. aureus* were found on the plain agar plates.

Sterile filtrates of staphylococcus cultures were prepared and fed to human volunteers. Typical symptoms of gastroenteritis followed. There was close resemblance between the symptoms produced by swallowing small amounts of the filtrate and the symptoms in the persons poisoned by the gravy. In both cases the onset of symptoms occurred 3 hours after the ingestion of the toxic material.—Edwin O. Jordan and John R. Hall, *J. Prev. Med.*, 5: 387 (Sept.), 1931.

Experimental Study of Possible Routes of Contamination of Cakes with Food-Poisoning Staphylococci—The object of the present experiments was to determine how cake that had been found to be a carrier of staphylo-

cocci causing food poisoning might have become contaminated — whether the staphylococci might have been present in the ingredients or whether the contamination might have occurred after baking.

Staphylococci introduced experimentally through inoculated egg whites or yolks into various cake batters of either the sponge or butter variety were killed during the baking process. This was true in cakes of pH ranging from 5.0 to 8.2. Staphylococci similarly introduced into a cream filler for cakes were destroyed during the cooking of the filler. Staphylococci inoculated into the filler after its preparation invaded the cake substance. Human feeding experiments showed that both the organisms and the toxic substance were present in the filler and in the cake itself.

It seems likely that in some of the food poisoning outbreaks due to staphylococci in cake, the filler is contaminated after its preparation, the microörganisms from the filler later invading the cake substance.—G. M. Dack, Oram Woolpert, Isabel Noble and Evelyn G. Halliday, *J. Prev. Med.*, 5: 391 (Sept.), 1931.

The Effect of Heat Storage and Chlorination on the Toxicity of Staphylococcus Filtrates—Sterile filtrates of staphylococcus cultures known to be capable of producing symptoms of food poisoning were studied to ascertain what effect heating, storage and chlorination had on their toxicity. In several cases ingestion of sterile staphylococcus filtrates, boiled as long as 30 minutes, was followed by nausea, diarrhea and prostration. In other experiments with human volunteers no symptoms followed the ingestion of filtrates boiled for 30 minutes.

Although the toxic substance present in staphylococcus filtrates is not completely destroyed by exposure for 30 minutes to the temperature of boiling water, some diminution in toxicity may be caused by heating even at temperatures below 100° C. Sterile filtrates stored in the icebox for 3 or 4 weeks did not lose their toxicity.

In one case symptoms of gastroenteritis were produced by a filtrate stored in the icebox for 67 days. While the toxic power of the filtrates does not disappear on storage it is no doubt somewhat weakened.

In testing the effect of chlorine 0.1 c.c. of 0.0915 per cent solution of chlorine was added to a filtrate 3 minutes before it was swallowed. Typical symptoms occurred in 5¼ hours but they were less severe than in the case of the control. When 5 c.c. of the same chlorine solution were added the ensuing symptoms were very slight.

The data show that contact for 3 minutes with a rather strong dose of chlorine did not destroy the toxic quality of the filtrate.—E. O. Jordan, G. M. Dack, and Oram Woolpert, *J. Prev. Med.*, 5: 383 (Sept.), 1931.

A Preliminary Report on the Bacteriological Examination of Fresh Cream and Artificial (Reconstituted) Cream—A bacteriological comparison of fresh cream and artificial (reconstituted) cream has been carried out with the following results:

1. The bacterial content of the fresh cream (plate count on standard agar and direct microscopical method) is practically 40 times that of the artificial cream.

2. The average keeping quality of the fresh cream during September to December was 38 hours, as compared with 56 hours for the reconstituted product.

3. The fresh cream reduced double strength methylene blue in two hours. The artificial cream generally took eight hours or over to reduce the dye.

4. The types of fermentation in the two products is very characteristic. All samples of the artificial cream gave a very stormy fermentation within 24 hours at 37° C. The natural product in all cases gave an even non-gassy curd.

5. Anaerobic spore formers of the *Clo-*

stridium Welchii group were detected in the artificial cream. These were traced to the milk powder used in manufacture.

—(*Welsh J. Agric.*, 6: 284–9, 1930. Summary taken from Imperial Agric. Res. Conference, 1927. Abstracts of *Papers on Agric. Res. in the United Kingdom*, 1929–30, p. 101.) Abstract, *Bull. Hyg.*, 6: 775 (Oct.), 1931.

The Distribution of Vitamin B Complex and Its Components in the Peanut—Two lines of experimentation were followed—one to determine the amount of vitamin B complex in peanuts and the other to determine the proportion of the components (B and G). Virginia Runner peanuts were used, both raw and blanched, the blanching consisting of heating in oil to about 300° F. insufficient to develop a brown color in the kernels.

The peanuts were separated into split halves, hearts, and skins, in the proportion of 95 per cent splits, 2.3 per cent hearts, and 2.7 per cent skins. Rats were fed a B complex free ration consisting of varying percentages of purified casein and starch, meat residue, vegetable fat and salt mixture, supplemented with cod liver oil.

In one series the peanut supplements were added to the basal ration so that all were approximately equal in energy value. On low levels of peanut supplements, the appetite of the rats was affected so that insufficient amounts of the vitamin were consumed.

Another series was run in which definite daily weighed quantities of peanuts were fed to the rats. On a 10 per cent level, none of the peanut products stimulated growth; good growth was made on 20 per cent of raw or blanched splits but not much increase with this level of blanched hearts. Moderate growth resulted with 20 per cent of blanched skins but no improvement when this was increased 50 per cent, possibly due to tannin or other astringent present.

Several months later, these experiments were repeated with the same peanuts but inferior growth showed storage had somewhat depleted the B complex. All of the blanched products contained less vitamin B complex than the corresponding raw products. In the determination of components B and G two rations were used—one devoid of both components and the other containing the antineuritic with very small amounts of vitamin G. The antineuritic vitamin from rice polish extracts did not induce growth in rats on the B complex free ration.

Greater gains were made when autoclaved yeast was substituted, showing peanuts relatively richer in the B than in the G factor.—F. W. Sherwood and J. O. Halverson, *J. Agri. Res.*, 44: 849 (June 1), 1932.

Increasing the Vitamin D Content of Milk—Since milk under ordinary conditions is a poor source of vitamin D, numerous trials have been undertaken to increase this vitamin in cow's milk, with conflicting results, except by feeding cod liver oil which tends to depress the fat percentage. In these experiments, irradiated ergosterol was administered, preliminary work having shown that 130,000 Steenbock rat units yielded a marked increase in the vitamin D of the milk from one Jersey cow.

Two Holstein cows in approximately the same stage of lactation and the same milk production were used under winter feeding conditions. The trial was divided into periods of 3 to 4 weeks' duration, and controls were fed 50 c.c. of corn oil, and the experimental animals the same amount of oil, containing in various proportions irradiated ergosterol from 7,500 to 200,000 Steenbock rat units.

The milk was made into butter which was fed to rats and the vitamin D measured by curative and prophylactic methods. The vitamin D content of

the butter fat increased from 0.17 Steenbock rat units per gm. to 2.5 per gm. when 200,000 rat units were administered. Similar results were obtained with chicks as the experimental animals.

Two rachitic babies were fed milk from the cows receiving the 200,000 rat units and showed steady improvement. Post-mortem of the cows used in the test showed no abnormality from feeding of the ergosterol.

It is pointed out that while it is possible to increase the vitamin D content of milk many times, this method is too expensive to warrant its general application.—W. E. Kraus, R. M. Bethke and C. F. Monroe, Ohio Exper. Sta. *Bimonth. Bull.*, 136 (May–June), 1932.

CHILD HYGIENE

CHILD HEALTH TODAY*

CHILD health today takes into consideration the welfare of the whole child in his varied relationships to home, school, church, and the community at large. Health is a delicate balance which the individual maintains between a number of conflicting forces, some of which reside in the child himself. Others arise from his immediate environment. This health balance is easier to secure in some children than in others. Individual children differ a great deal in their ability to keep healthy. No child is so well conditioned but that some untoward force may upset his health equilibrium. Not only does the child have to make constant adjustments and readjustments but his parents or guardians have to be ever on the alert to protect him.

Scientific knowledge must be applied to child health. Health habits should be inculcated, beginning early in infancy. In many situations the child is helpless to protect himself. For instance, the child has very little if any choice in the selection of his food or in the kind of milk or water he drinks. He has no control over exposure to communicable diseases in the community. He is at the mercy of motor traffic in the streets and public highways. Over these and many other hazards the enlightened community must exert control through a well organized department of public health. But a health department, no matter how well organized, cannot function effectively without intelligent cooperation on the part of the parents. In a very real sense the public obtains as much health protection as it is willing to pay for. Furthermore, it should abide by the public health regulations. We have at present enough scientific knowledge concerning child health which, if applied more extensively, would give to our children healthier and happier lives. It is especially important at this time that we do not relax efforts to keep our children in the best of condition.

We are on the threshold of a critical period in which more careful scrutiny will be given to programs and methods proposed in the name of child health. Future programs will not be launched upon sentimental propaganda of well meaning but misguided community organizers, but will be formulated on the basis of facts ascertained by trained investigators and carried out by technically trained persons. Practical appli-

* Radio talk over KMTR, Los Angeles, July 6, 1932, by Richard A. Bolt, M.D., Director of the Cleveland Child Health Association and Lecturer in Public Health and Hygiene at the Summer Session of the University of California, at Los Angeles, Calif.

cation of well established principles and methods to the individual child will be demanded of physicians, nurses, dentists, teachers, and social engineers.

There has been recently much loose talk to the effect that our child population has not suffered unduly from the depression. This is very unfortunate as it tends to divert us from the main issues involved in preserving health standards for the child which we have built up after many years of effort. The reduction of infant mortality together with the generally low death rates throughout the country have been pointed to with assurance that we need not worry about the health of our children. While it is true that our infants have been fairly well looked after and that our children in the schools have been kept from actual starvation by supplementary feeding, it by no means indicates that the children are in the best physical and mental condition. Children may be kept alive under such circumstances and at the same time be suffering from malnutrition and other grave disorders. There are indications from certain large centers that a considerable number of children, especially between 2 and 6 years of age, are not in a satisfactory condition at present. It must be borne in mind that the results of malnutrition and undernutrition do not manifest themselves immediately. Furthermore, a chronic state of malnutrition predisposes children to tuberculosis, the effects of which appear but slowly. This was noted distinctly in the war torn countries of Europe following the World War. The effects upon body growth and development may not be evident for many years.

There is another phase of this matter which should receive more earnest attention in these trying years. The uncertainty and insecurity in many of our homes today has a very bad effect upon both the physical and mental life of children. Mental unrest and defiance of accepted social codes follow closely in the train of broken and upset homes. It is well known that there is a close relationship between physical and mental health. This is already showing itself in all of our large centers of population; in the increase of juvenile delinquency; in the revolt of youth, and in crimes against person and property.

School teachers report that children coming to school without breakfast, or inadequate breakfast, are listless and apathetic. A hungry child cannot be educated properly. Schools have found it imperative to finance extra feedings either from private contributions or out of the public treasury. Some states have passed emergency measures permitting school authorities to use school funds for supplementary feedings. This can be done readily as the school lunch room has become a useful adjunct to every progressive school system.

In the wave of economy now sweeping the country certain cities at first deemed it advisable to close the playgrounds during the summer months. More discerning thought would have determined to keep as many of them open as possible. Public playgrounds not only afford places of recreation for restless and harassed children but also make possible the feeding of those needing special nutritional care. They also afford opportunity to check up on the physical defects of a considerable number of children. This summer in some places physicians, dentists, nurses, and recreation directors are giving excellent coördinated service in the playgrounds kept open at public expense.

Good nutrition is a basic requirement of every child. Fortunately a well balanced dietary for the growing child is not complicated. It can be understood readily by any intelligent mother. The necessary elements which go to make up such a diet are relatively cheap at the

present time. They consist mainly of the following:

1. One quart of clean, wholesome milk for each child daily
2. A moderate amount of green leafy vegetables
3. Fresh fruit, preferably of the citrus variety
4. Some cereal foods. The whole grain products are desirable
5. Butter and fresh eggs

Very little meat will be necessary if the child is given adequate quantities of the foods just mentioned.

California is abundantly blessed with sunshine which is fortunately supplied free to all who will take advantage of it. Children should spend a considerable part of each day in the open air and sunshine and should be allowed ample fresh air during the night. There is absolutely no excuse in this part of the country to allow any child to develop rickets, scurvy, or any other of the deficiency nutritional diseases.

Accidents of one kind or another today cause the death or crippling of too many children. Accidents have assumed alarming proportions among children between 5 and 15 years of age. Accidental deaths of children under 15 years of age make up about one-fifth of the total deaths from accident. Deaths from burns, drowning, falls, and automobile accidents are most frequent. The total number of child deaths from automobile accidents has increased considerably in recent years, although the proportion of child deaths to adult deaths from automobile accidents has decreased almost one-half. While deaths from burns, falls, and drownings have decreased, the automobile death rate remains unduly high. This condition of affairs certainly calls for more vigilance in traffic regulations; more safety education and better provisions for the safety of children in our homes, at the playgrounds, and especially on the streets. Public playgrounds are an antidote against accidents from playing in the streets. Here, as in the case of many other means of prevention, our knowledge far outruns our practice.

A development of major importance in which we are just beginning to get our feet on the ground is that of health education. The immediate future should see a thoroughgoing development of health education, not in name only, but in the basic elements of what actually contributes to health. Pioneer work has already been done along this line, but we must still evolve a sound pedagogical method of health education beginning in parental instruction and running throughout our whole educational system from kindergarten into college. If we can agree upon a few of the fundamentals of health and impress our teachers and prospective teachers with the value of getting these over to the child in the same spirit and with similar methods now employed in the best school practice, much will have been gained for child health.

We now possess two protective measures which should be applied to every child. Vaccination against smallpox and immunization against diphtheria have been thoroughly tested and proved relatively safe and effective against these two diseases. Where they have been applied thoroughly smallpox and diphtheria have gradually disappeared from the community. As young children are most susceptible to these diseases immunization should be carried out early in the child's life.

It is now well known that tuberculosis is usually acquired in childhood either from individuals in the home affected with tuberculosis or from infected milk. We have largely eliminated infected milk by tuberculin testing of cattle and by the efficient pasteurization of milk. As pasteurization of milk becomes more and more prevalent, crippling from tuberculosis of the bones and joints will

become less and less common. Every child should be examined periodically by a competent physician in order to detect the earliest signs of tuberculosis. In this way only can the most effective measures for its control be applied. One of the most serious aspects of tuberculosis today is its appearance in young women of high school and college age. The tuberculosis death rate has been reduced considerably at all age periods except among young women. The dieting fad to secure a slender figure and overactivity at school and in social events undoubtedly contribute to this condition.

The prevention of tuberculosis in childhood is relatively simple if a few principles are carried out as follows:

1. Keep the child away from contact with tuberculous individuals, especially in the early years of life
2. Protect the general milk supply by efficient pasteurization and heat all milk given to young children
3. Maintain a good nutritional status in the child by proper feeding
4. Prevent as far as possible overactivity and fatigue in young people
5. Have the child examined periodically by a competent doctor

We hear much discussion today about the increase of heart disease. The mounting death rate from this disease is giving considerable concern to health authorities. When vital statistics for heart disease are carefully analyzed it is seen that the upward trend in heart death rates during the past 20 years has taken place largely in those over 40 years of age. In every age group under 40 years the death rates from heart disease have decreased. This is particularly encouraging in age groups under 15 years. It is fair to conclude that the efforts put forth for child health have had something to do with this result. Earlier and more exact diagnoses of heart disease are now made. Some of the infectious diseases which are frequently complicated by heart disease have been brought under better control. Focal infections of the teeth, sinuses, tonsils, and adenoids have received earlier attention. Heart disease in childhood follows closely in the wake of rheumatic fever. This disease also appears to be on the decline in a number of places. The outlook, therefore, for the control of heart disease in childhood is not so gloomy as the crude death rates from this disease would lead us to believe.

Enormous progress has been made in the diagnosis and treatment of diabetes in children. Before the discovery of insulin practically every child who developed diabetes died before reaching 12 years of age. Now, with the proper administration of insulin thousands of children with diabetes at all ages are living and enjoying the normal activities of childhood. Many of these children are exceptionally intelligent. Some of the earlier cases treated with insulin are now married and have had normal children. Summer camps for diabetic children have been established in Cleveland, Detroit, and a few other cities where every facility for diabetic routine is available. These camps should be developed as an integral part of our child conservation program.

Our present-day gains in child health have been along the following lines:

1. Reduction of infant mortality by means of better feeding methods, protection of milk supply, and more skilled medical and nursing care
2. The control of smallpox and diphtheria and certain other communicable diseases
3. Improvement in nutritional standards
4. Prevention and control of tuberculosis
5. Prevention of simple goiter
6. Reduction in certain of the accidents
7. Treatment of diabetes in children

Any retrenchment, therefore, in our public health program which jeopardizes these gains is a confession of our ignorance or callousness to the essential health needs of children.

PUBLIC HEALTH NURSING*

Japan Has a Course for Public Health Nurses—St. Luke's College of Nursing in Tokyo started a one-year post-graduate course in public health nursing on May 1. Nurses will be prepared for the general field of public health nursing including school and industrial nursing. Instruction in public health nursing, preventive medicine, nutrition, methods of teaching, and social case work, plus practice work in clinic and field, are included in the course.—*Pub. Health Nurs.*, XXIV, 7: 414 (July), 1932.

Public Health Nursing in Baltimore—Dr. Joseph W. Mountin, of the U. S. Public Health Service, recently completed a health and hospital survey of Baltimore at the request of the Health Commissioner. Among the 23 major recommendations which he presented as a result of the survey are the 2 following which deal specifically with public health nursing:

No. 18—That as soon as practicable all nursing services of the Health Department be combined into a single generalized service and that a special supervisory staff sufficient to insure proper balance of work by the field nurses be provided.

No. 19—That new appointments to the nursing staff be limited to nurses possessing special training or previous experience in public health work, or that in lieu of such training or experience newly appointed nurses be given an introductory period of training in a special training area.—

Public Health Is Purchasable, *Baltimore Health News*, IX, 7: 51 (July), 1932.

Prenatal Nursing in the Rural Areas—Health workers have known for some time that wherever there has been an organized effort to provide adequate maternity care, maternal mortality has been reduced. The report from a Toronto hospital shows that, of 1,020 women who attended a prenatal clinic and were confined in the hospital, only 1 woman died, and she died of heart disease. The Maternity Center records show a maternal death rate of 2.2 as compared with a rate of 6.2 for mothers living in the same district but not receiving their special care.

A great obstetrician has said that prenatal care is not an end in itself but only a means to an end; that good prenatal care is nothing but the foundation of good natal attention; neither is complete in itself, and if either is inadequate both may result in failure. "Nor," he says, "are they complete without good postnatal care. Improper postnatal care may thwart the result of good prenatal care."

In the city or the rural areas every expectant mother needs the assistance of someone who has time to sit down with her unhurriedly and dispel her fears and consider some of the commonplace details of her life. She needs this no matter how adequate her medical supervision. Nursing supervision does not take the place of medical supervision but supplements it.

In rural communities there are greater distances, fewer health workers, and greater social problems; these all complicate the prenatal program. Rural mothers are often lonely and eager for someone to talk to, and an alert sympathetic nurse can do a great deal of constructive teaching if she has the ability to gain the confidence of the mother. One nurse finds that she gets farthest if she takes time to have tea with her patients.

In some districts of Canada prenatal

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 6 State House Annex, Indianapolis, Ind.

group teaching has been done. This has decreased the nurse's travel time, given her more contacts, enabled her to do more effective teaching because demonstrations were possible and exhibits available. In most rural areas, however, this program is not practicable because of distance and lack of transportation, and nurses have to rely on home visits. Some nurses during the long snowy winter months keep in close contact with their patients by mail.

The best publicity for the nurse's prenatal supervision is the service rendered. One nurse increased her number of prenatal cases from 20 to 35 in 3 years. She told her patients if they valued her services to tell their friends about it, which they did.

The success of a rural prenatal nursing service depends upon the coöperation of the public health nurse with the medical profession and her ability to demonstrate the value of such a service to the public.—M. McCuaig, A Rural Prenatal Programme, *Canad. Pub. Health J.*, XXIII, 6: 271–274 (June), 1932.

A Stitch in Time—A public health nurse in Baltimore brought a sick boy home from school. He had a severe pain in his side and the family's first impulse was to send out and get castor oil to give him. The nurse persisted in entreating them to call the family doctor and persuaded them not to give a purgative, but to apply an ice bag to the side instead. The physician came and within an hour a surgeon had removed the boy's gangrenous appendix. The family physician wrote a letter to the city health department praising the nurse's work.—Public Health Nurse On the Job, *Baltimore Health News*, IX, 7: 53 (July), 1932.

Public Health Nursing in State Health Departments—The development of public health nursing in state health departments is potentially the keynote of a sound public health nursing program in each state. However, in most states the budget and personnel for public health nursing are entirely inadequate to carry on a sound program. The different states show wide variations in the administration and functions of public health nursing in their health departments. A recent study indicates that these services have sprung up haphazardly without any accepted conception on the part of anyone as to the extraordinary opportunities or responsibilities of such services, and with no generally accepted fundamental principles of organization, function, or program.

In every state, also, we find a wide variation in local public health nursing services in organization, personnel, and program. Nationally there are generally accepted principles and standards of public health nursing which cannot be carried out locally to any great degree without some relatively immediate stimulus and leadership.

It is a generally accepted principle that public health nursing functions best as an administrative unit under the direction of a well qualified public health nurse, whether this unit is a separate division or bureau or functions as some part of the general administration set-up.

Local public health nursing organizations have functioned best perhaps where a local group of representative citizens have been associated with them. There might be an advantage in having a public health nursing council consisting of representative citizens from state groups to help strengthen the state public health nursing program.

Here are some functions the state department of public health nursing could carry on:

1. Put into practice standards of local organization and administration, of qualifications of personnel; of content of

program; and of records and statistics.

2. Be of advisory assistance to local nurses and organizations, giving a real educational rather than a mandatory or administrative service.
3. Carry on a staff education program for the nurses in the smaller and more isolated services in particular. This is done in some states by means of group meetings and special institutes. In other states there are field training centers where nurses can go to get "refresher" courses.
4. In some states public health nurses give direct service to local organizations, and this may sometimes be necessary to start the services, but it seems sounder to have local responsibility and local money for public health nursing supplemented by the state.
5. Study general and specific health needs of the state and results obtained from present activities to bring about a better distribution of nursing services in local areas.

If I am right that the sound and effective development of public health nursing will be furthered most through strong and adequate public health nursing services in state departments of health, it behooves all of us to act accordingly. What does this mean? To my mind, this implies a careful campaign of public education through various local and state groups—nursing, health, medical, and civic. It means backing, supplementing, and cooperating with the services that already exist. The responsibility rests on local public health nursing associations; on state nursing organizations such as S.O.P.H.N.'s and public health nursing sections of state nurses' associations; on the various women's clubs and other civic groups; and on the N.O.P.H.N. It may mean legislation. It is for each state to study what it does mean and to marshal its forces so that what seems to be the most strategic approach to our goals may not be left in its present somewhat chaotic and unrelated condition.—

Katharine Tucker, Relation of State Public Health Nursing Services to County and Local Services, *Pub. Health Nurs.*, XXIV, 7: 357–362 (July), 1932.

EDUCATION AND PUBLICITY*

As Never Before—This fall and winter, as never before, public health work must prove its case as an essential in community life.

Whether we do more or less in the interpretation of the health agency we cannot do it too well for the safety of the next budget.

Letters on the subject will be welcomed by this department.

Third and Last Call—What you have printed or distributed on the following subjects is desired for display at the Washington meeting of the A.P.H.A. in October.

National and state associations and departments: requested to send lists of publications, slides, pictures, etc., etc.; copies of plays and other special forms, whatever their subject matter.

News stories, etc.: clippings and releases both are welcome, but clippings are especially desirable.

Any good specimen of any form on any subject is desired.

Health councils and chests are requested to secure material from their member agencies.

Often two copies are better than one. All should be addressed to "Washington Display," Evart G. Routzahn, 130 East 22d St., New York.

Some of the topics on which material is especially desired: Cancer, diet and nutrition, diphtheria, heart diseases, measles, mental hygiene, mouth hygiene, rural sanitation, summer warnings and advice, winter warnings and advice.

Depression conditions, house organs or bulletins, popular health education, radio, school health and health education.

Write Before You Pack—If you have anything to show at Washington in October, please *write*—and write *now*.

Otherwise, please don't bring exhibits or displays which call for space at Education and Publicity Headquarters.

Last year at Montreal several enthusiastic health workers turned up with material *after all plans had been made and the space allotted.* They were taken care of, but they never knew what other plans were disrupted and disappointments were experienced. *So please write before you pack.*

The Depression Calls—To Washington!—The Washington meeting of the A.P.H.A. in October will mean all the more to those who face budget cuts and those who recognize increased need for more and better health education.

Come Bearing Questions—And Ideas—We get more and we give more at conventions when we come with specific questions we want answered. Questions to be answered by the speeches or in discussion, in lobby sessions, at exhibitor's booths, or the headquarters of national agencies.

There are cases on record of a staff conference discussing points on which their convention representatives were urged to gather information.

And at least one agency, the Wisconsin Anti-Tuberculosis Association, has discussed what ideas and experiences they could offer as contributions to the discussion in various sessions of a convention.

Statisticians, Epidemiologists . . .—The displays at Education and Publicity Headquarters at Washington will have something for each of them. Try it once!

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

Go To Meetings — Be a "Joiner"—To go to meetings of many kinds—to attend gatherings of all sorts—is a real help to the publicity worker. To meet people and to see people on their own grounds, to learn who they are, what they do, what they are interested in, what they talk about, is a real asset.

To be a member of organizations brings helpful contacts. Every membership held by any staff member of an agency has its value. The payment of a limited number of memberships is a good investment for the agency.

"Time Out" Needed for Good Publicity—Health officers and other executives do well to *encourage the taking of time for reading, thinking, studying and planning.*

The urge for production and the doing of many things long have handicapped some of the best workers in health education and publicity. And the pressure for haste and quantity has retarded the growth of the less capable workers.

Whether the worker is skilled or unskilled, time is a prime essential for good and better publicity.

Rules for Writing Copy—*Postage and Mailbag* quotes the following rules as having been originated by John H. Patterson, founder of the National Cash Register Company:

1 Know your subject
2 Use short words
3 Write short sentences
4 Make paragraphs short
5 Use big ideas
6 Put only one thought in each sentence
7 Write so that a child will understand it
8 Say precisely what you mean
9 Be brief
10 Be logical
11 Tell the truth
12 Never exaggerate
13 Don't imitate
14 Be enthusiastic
15 Write to impress the reader, not to express yourself or impress a competitor

Three Billions a Year for Health—"We Spend 3 Billions a Year To Get Well, Or to Keep Well," says *Business Week,* in the thirteenth of a series of articles on the "American Consumer Market." A diagram, "What the Average American family spent to get well or to keep well in 1929," gives the following estimates: Doctors $31, Dentists $12, Home Nurses $6, Institutions $39, Appliances $7, Drugs and Medicines, $33.

A table shows year by year expenditures, 1919–1930, detailed under general headings: Services; Goods and Appliances; Medicines and Drugs. The $3,330,000,000 estimate for 1930 was $446,000,000 drop from the 1929 figures.—*Business Week,* 330 West 42d St., New York, July 20, 1932. *25 cents.*

United Educational Program—This joint effort under the auspices of the National Social Work Council represents all the fields of health and social work. At present the various sections are concentrating on material for use in the community chest campaigns this fall and winter. The Health Section has already prepared several bulletins of material to be distributed to the chests by the Association of Community Chests and Councils.

Additional data from the field are requested for use in many forms of publicity intended to increase popular understanding of the significance of public health work maintained by public and private agencies.

Because of absence from the country, Dr. H. E. Kleinschmidt resigned as chairman of the Health Section of the United Educational Program, and was succeeded by Paul O. Komora of The National Committee for Mental Hygiene, 450 7th Ave., New York.

Low Cost Diet—A "List Of Publications On Low Cost Diet," distributed

by Social Work Publicity Council, 130 E. 22d St., New York. *Copy 4 cents.* This list, given below in full, is submitted for corrections and additions. The aim was to select widely adaptable and easily obtainable material. Some of the titles priced at 1 or 2 cents in quantity are much more attractive and usable in form, and of equal practicability to some of the locally produced cumbersome mimeographed sheets prepared for use by families.

American Child Health Assn., 450 7th Ave., New York:

Emergency Nutrition, by Henry C. Sherman. 4 pp. *3 cents;* 10 to 24 copies, *1 cent* each; lower rates for larger lots.

Food At Low Cost, by Lucy H. Gillet. 4 pp. *3 cents;* 10 to 24 copies, *1 cent* each; lower rates for larger lots.

Bureau of Home Economics, U. S. Dept. of Agriculture, Washington:

Adequate Diets for Families With Limited Income. 16 pp. *Free.*

The Family's Food at Low Cost. 4 pp. *Free.* 100 for *25 cents.*

Getting the Most for Your Food Money. 4 pp. *Free.* 50 for *25 cents.*

(Send cash orders to Superintendent of Documents, Washington, D. C. Lower rates for larger quantities.)

Children's Bureau, Washington:

How to Spend Your Food Money. 1 p. *Free.* 50 for *25 cents.*

Emergency Food Relief and Child Health. 10 pp. *Free.* 50 for *50 cents.* (Send cash orders to Superintendent of Documents, Washington, D. C. Lower rates for larger lots.)

New York Nutrition Committee, 105 E. 22d St., New York:

Feeding the Family at Low Cost. 1 to 19 copies, *5 cents* each; 20 to 49, *3 cents* each; 50 or more, *2 cents* each.

New York State College of Home Economics, Ithaca:

Food at Low Cost: References to Pamphlets and Leaflets (annotated—8 titles for untrained homemaker—11 titles for social or health worker). 8 pp. Single copies *free.*

Six low cost menu memoranda (with selected recipes). 42 pp. Single sets *free.*

Metropolitan Life Insurance Co., New York:

Three Meals a Day: Suggestions for Good Food at Low Cost. *Free.*

President's Organization on Unemployment Relief, 1734 New York Ave., Washington:

Food and Nutrition of Our Children. 4 pp. *Free.*

Evaporated Milk Assn., 203 N. Wabash Ave., Chicago:

Feeding a Family at Low Cost. 13 pp. *Free.*

National Dairy Council, 221 N. LaSalle St., Chicago:

Living Well at Low Cost. 4 pp. *Sample free.*

Home Economics Committee—Associated Charities, Federal Reserve Bank Bldg., Cleveland:

A Suggestive Budget for Families of Small Income. 34 pp. *35 cents.*

Council of Social Agencies, 203 N. Wabash Ave., Chicago:

Chicago Standard Budget for Dependent Families. Includes low cost meals and weekly food lists. Revised June, 1932. 52 pp. *25 cents.*

Family Welfare Association of America, 130 E. 22d St., New York:

Family Budgets. (List of printed or mimeographed material from 37 cities on family budgets, food budgets, etc.—weekly cash food allowances for family of 5, reported from 21 cities—suggested reading on family budgets, etc.) 14 pp. *6 cents.*

"Education and Publicity" department, American Journal of Public Health, 450 7th Ave., New York:

Consult files for mention of new publications—and for depression diet discussion references in public health periodicals.

Using Mail in Health and Social Work—Money raising by mail, and the use of letters in promoting an idea will be treated in the Social Service Departmental, Direct Mail Advertising Association, meeting at Hotel Pennsylvania, New York, Oct. 5–7, 1932 (Wednesday through Friday).

The Wednesday morning session will take up: How to Cut Mailing Costs and Solve Postage Problems, Layout of Letterheads and Leaflets, How to Test Mailing and Make the Most of a Direct Mail Budget, How to Build Lists, Standard size envelopes vs. baronial or monarchial size; stamped return envelopes vs. postage saver return envelopes, Typed letters vs. multigraphed; four

line fill in vs. one line fill in, How to Improve the Style of Letters Appealing For Funds. There will be no speeches. Questions will be prepared to be answered by a group of specialists.

The full program and information about the exposition will be sent upon request to D.M.A.A., 19th floor, Hotel Pennsylvania, New York.

EDUCATIONAL PUBLICATIONS

Some of the titles listed below will have continued value for reference by the worker in health education.

A single copy of one of them sent to a newspaper editorial writer may prompt an effective editorial. A prominent business man or a leader in the community may welcome a copy of one of the listed titles.

A few copies from this list may bring as significant results as some effort costing much more in money and time.

"Are We Becoming Overly Health Conscious?" by John Sundwall, M.D., University of Michigan, Ann Arbor. Reprint from *Journal of Health and Physical Education*. Oct., 1931.

My answer is emphatically, No. Moreover I am going to try to convince you that the dawn of a much needed era of health consciousness is just appearing on the horizon.

"The Medical Charlatan: Exploiter of the Sick-Well-Ignorant-Credulous"; "The Case Against Prostitution"; "The Truth About Syphilis and Gonorrhea"—three of a series of four 12-page folders well done for reaching leaders in various walks of life. Note the paper, type, lay-out and folds. American Social Hygiene Assn., 450 7th Ave., New York. *5 cents each. Quantity prices.*

"Cancer and Its Care: A Handbook for Nurses," American Society for the Control of Cancer, 25 West 43d St., New York. 47 pp. *Free.* The bibliography lacks the information as to publishers, paging, and prices to be found in the other recent publication of the society. It is dated.

"Education," Supt. of Documents, Washington. *Free.* Revised list of government publication. See "Health Education," "Sex Education," "Nurses," etc.

"Annual Medical Service," by Rorem, Julius Rosenwald Fund, 900 S. Holman Ave., Chicago. *Free.*

"The Costs of Medicines," by Rorem and Fischelis; and "The Healing Cults," by Reed. Committee on the Costs of Medical Care, 910 17th St., N. W., Washington, D. C. *Free.*

"Free Publications of the Evaporated Milk Assn.," 203 N. Wabash Ave., Chicago. Revised list of publications. *Free.*

ECONOMIES

The careful placing of single copies or small quantities of selected articles, reprints, or pamphlets may win community leaders more effectively than more widespread efforts. More than ever does it seem desirable to win the key men and women of the community. Every month this department tells of publications valuable for this purpose.

"Submitted as an example of money saving" we have received a one-sheet mimeographed condensation of the annual report of the Iowa Tuberculosis Assn., Des Moines.

"Retrenchment—in the spirit of the times it has been deemed wise temporarily to reduce the issues of *Pennsylvania's Health* (State Dept. of Health) to one-half its usual size."

BOOKS AND REPORTS

Maternity Handbook—*By the Maternity Centre Association of New York City. New York: Putnam,* 1932, 178 pp. Price, $1.00.

Any maternity handbook got out by the Maternity Centre Association is bound to be good: this one with its wealth of detail and of illustration is something which every prospective mother should have. Nurses, too, will find it most useful, more particularly because of the many points of technic brought out. The diction employed is simple, colloquial and clear. Beginning with an introduction, the theme of which is " teamwork by mother, father, doctor, nurse, keeps most mothers well and comfortable," the book goes on to discuss the hygiene of pregnancy, the balanced diet, clothing for mother and baby, hospital and home deliveries, the after-care of mother and baby, and training the baby.

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MERRILL E. CHAMPION

The Administration of Regulatory Inspectional Services in American Cities—*By Edna Trull. New York: Municipal Administration Service,* 1932, 184 pp. Price, $1.00.

A mass of materials has been collected portraying the inspectorial services of 38 cities which have been used as a basis for the study. The statistics were gathered in 1931 and represent the practice of 1930. The cities were selected with a view of obtaining a cross-section in population, in geographical distribution, and in form of government. The report should be of special interest to the health organizations of those cities which participated and no pretense has been made of collecting practise methods from all cities.

It is recognized that there are now many inspectorial services which clutter up and encumber the personnel and finances of health departments which do not have any real health foundation. Not only are most health departments dealing with matters which are distinctly a health menace but they have been forced to give attention to nuisances which are merely offensive to sight or smell and not inherently dangerous.

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topics of poisonous, parasitic, and vector insects, the authors have treated the insects and related animals in their systematic groups, though not in the usual systematic order.

The early and later history of the relations of arthropods to disease is briefly reviewed in the opening chapter. This is followed by a discussion of the ways in which arthropods affect health. The arachnids come first in the systematic discussion, including the poisonous "black widow" spider, solpugids, scorpions, chiggers, itch and hair follicle mites, and the ticks, especially the carriers of Texas fever, Rocky Mountain spotted fever, tularemia, Oroya and relapsing fevers.

The insects proper are then taken up in the accepted sequence, beginning with body, head, and pubic lice in relation to typhus and trench fever. This is followed by a discussion of the true bugs, or *Hemiptera*, including the bed bug and the assassin bugs, especially the carrier of Chagas' disease. The beetles (*Coleoptera*) are concerned only to a very limited degree as facultative parasites, as vectors, or as poisonous species, and *Lepidoptera* mainly as the source of irritating or poisonous scales or hairs. The *Diptera* play a much larger part, the sand flies (*phlebotomus*) being implicated in 3-day fever, Oroya fever, verruga peruviana, Carrion's disease, and more recently in the Leishmanioses, kala azar, and oriental sore; the mosquitoes in malaria, filariasis, yellow and dengue fevers; and flies in typhoid, and various myiases; and fleas in plague.

The book is a mine of carefully selected, well organized, and clearly stated information about insects in relation to disease, control and preventive measures, and the essential biological facts pertaining to understanding these relations. Keys for determination of important species are included and an extensive bibliography and index are provided. It is an invaluable text book and a very useful work of reference for the public health worker and for the laboratory.

C. A. KOFOID

An Introduction to Materia Medica, Drugs and Solutions—*By Stella Goostray. (3d ed.) New York: Macmillan,* 1931. 214 pp. Price, $1.75.

The third edition of Miss Goostray's *Introduction to Materia Medica, Drugs and Solutions* (September, 1931), makes a very helpful book for the young teacher. The subject matter has been rearranged somewhat, to give the student a more interesting approach. The sequence is logical and the content adequate for an elementary course in materia medica.

Interesting references, suggested exercises, and blank pages for the use of the student, add to the practical value. It is small enough to be carried about by the private duty nurse, a point also in its favor, making a rather comprehensive review of commonly used drugs, their dosage and action. "Multum in parvo," we would say of this little book.

HANNAH STEVENS.

The Science of Human Living—*By Mae Johnson Corwin and Walling Corwin. San Francisco: Harr Wagner Publishing Co.,* 1931. 464 pp. Price, $1.68.

The authors have added another excellent volume to their science series. This book has been prepared for junior high school students and it is written in an interesting and flowing style. It is a text that combines physiological facts and health education. It vitalizes technical physiological knowledge by showing how it can be put to practical use in daily healthful living. The book covers a wide field, including sections on personal hygiene, public health, approved health habits, mental health, home sanitation, infant welfare, and home nursing.

The student is introduced to personalities who by perseverance and right living have developed strong, healthful bodies and to men and women who have contributed to the science and promotion of public health.

Diagrammatic illustrations, specific examples illustrating the subjects discussed, and enough statistics to be impressive yet not burdensome add to the value of the text. A lesson plan is incorporated in each chapter and the comprehensive index and bibliography will be aids to the teacher and pupil.

This book should enrich the well-being of every boy and girl who reads it. A. B. TOWSE

Elementary **Bacteriology**—*By Joseph E. Greaves, Ph.D., and Ethelyn O. Greaves, M.D. 2d ed. Philadelphia: Saunders,* 1932. 535 pp. 130 ill. Price, $3.50.

The changes and additions in this second edition have necessitated a slight increase in the number of pages, but the original plan of the book has been preserved. The chief additions are in the sections dealing with milk, butter, water, the bacteriophage, and the application of bacteriology to arts and industries. Some new and good illustrations have been added. The fundamentals of bacteriology are presented in a full and interesting manner which should hold the student's interest. The historical treatment of various phases of the subject are particularly to be commended. The make-up and printing of the book are excellent. FRED O. ADAMS

Public **Health Organization**—*Report of the Committee on Public Health Organization. A Publication of the White House Conference. New York: Century.* 338 pp. Price, $3.00.

This report includes, in addition to an introductory statement, sections on rural, city, state, federal, and non-official public health organization, together with chapters on the Training of Personnel, the Administration of Child Health Work as Part of Official Health Programs, Relation of Practitioners of Medicine and Dentistry to Health Programs, Health Aspects of Food Control, Research, and a final chapter of Recommendations.

Each section contains a summary of findings and conclusions, a somewhat detailed discussion of types of organization and service, and the extent to which various types of organizations and services are carried on. For those desiring even more specific detailed information, there are numerous tables giving the states, counties and municipalities carrying on various types of service; increases or decreases in such services in recent years; and per capita expenditures and salaries of some of the more important administrative positions. The data covered are for the year 1929. For the most part, the years 1923 to 1929 are included, although in some instances information is available from 1915 to 1929.

Among the many important conclusions are:

Rural health departments should be based upon the county unit, and should be an integral part of the county government. For counties where the population is too small, or the financial resources inadequate to justify a separate organization, some plan of uniting with other counties to form a larger health district should be devised.

The system of state and federal subsidies to promote and maintain county health departments has proved its utility and should be extended.

There should be better coördination in the expansion of consultant service to local health departments, and state and federal public health services should play a leading part in the performance of such service.

Some activities now included in the program of most health departments can be transferred gradually to the general practitioner of medicine. In the interest of child health, in so far as practical, the family physician should become a practitioner of preventive as well as curative medicine.

The experience of the municipal departments

has demonstrated conclusively that programs for the improvement of the health of the mother and child can be conducted successfully only as part of the general program of a well organized health department.

The health officer of any governmental unit must be recognized as the one person directly responsible for the health of the people in his district. . . . It is the primary duty of the nonofficial agency to support and aid him in his difficult task.

The nonofficial agencies in a given community should join together in a health council, preferably under the chairmanship of the health officer or his representative. They should make a serious study of their common problems and relationships and reach definite agreements as to the sphere of each.

These are but samples of the many important conclusions of the committee. Every person interested in public health organization and administration, particularly every health officer, will find this publication a most important reference book. CARL E. BUCK

Social Work Administration—*By Elwood Street. New York: Harper,* 1931. 466 pp. Price, $3.00.

The principles underlying successful social work administration are discussed in a comprehensive manner in this book which is one of the Harper's Social Science Series. The book deals with a wide range of subjects, including administration, organization committee management, the choice and equipment of an office, the selection of personnel and policies, budget making and control, statistics in administration, and team work between agencies. Organization charts and other graphic methods are illustrated. This volume should prove useful as a guide to administrators of social agencies and of other types of organizations. The observations and experiences may be adapted to local needs and opportunities. IRA V. HISCOCK

The Insect Menace—*By L. O. Howard. New York: Century,* 1931. 374 pp., 64 ill. Price, $3.50.

This volume was written for the purpose of arousing the public to an appreciation of the insect menace. With this in mind, the author has presented his appeal in nontechnical language, and has used numerous examples, derived from the literature as well as his own observations, to illustrate his conception of the insect menace to man. It is a very interesting account of the ravages of insects, of the development of methods of biological, mechanical, and chemical control.

The author points out that insects have been in existence some 40 million years or more as compared with about 400,000 for man. Since the generation time of insects is so much shorter than that of man, insects have had 12,500 times the opportunity to develop forms suitable for their preservation. Other advantages of insects, such as the superiority of their anatomical structure, size, protective coloration, rate and types of reproduction, and more rapid digestion of food, are described. The one possible advantage of man over insects, he states, is in the nervous system.

As interesting examples of specialization of aquatic insects, the author speaks of the dragon fly as an "animated fly trap," and calls a species of water bug an "animated baby carriage."

The multiplication of a number of serious insect pests, such as the European corn borer, the clover-seed midge, and the cotton boll-weevil, is attributed to the agricultural methods being employed. These and other pests have increased because man has made more food available. The monetary loss during 1920 in the United States from insects has been estimated at more than $2,200,000,000, which does not include the losses resulting from diseases of man transmitted by insects, which cannot be estimated with accuracy. Such diseases as malaria and yellow fever result in enormous labor losses and sometimes loss of commerce.

In order to combat the depredations of insects, studies are being made of their life histories to determine what variations in cropping methods will tend to decrease the chances of insects increasing in numbers. Other studies are being made to find and utilize secondary parasites for control. The narrative telling of the introduction and rearing of insect parasites to prey upon other insects is very interesting. These and other studies have already provided some measures for the control of important insect pests.

The author suggests that if the wastes caused by insects could be prevented, there would be no need for birth control measures to prevent an over-population of the world. An abundance of anecdotes and illustrations serves to prevent the reader from becoming depressed by realization of the seriousness of the insect menace.

The standing of the author assures the substantial accuracy of the statements in the book. It can be recommended to all readers, professional or otherwise, without hesitation.

NEWELL R. ZIEGLER

Problems of City Life—*By Maurice R. Davie. New York: Wiley,* 1932. 732 pp. Price, $4.25.

This volume represents an intensive study of modern city life, from the viewpoint of urban sociology. It emphasizes normal conditions in dealing with both physical and human environment. The book is divided into 5 parts of 3 to 6 chapters each. Following a consideration of the modern social environment, the growth of cities, city planning, the traffic problem, and housing, in Part III 6 chapters are devoted to an understanding discussion of health. Parts IV and V, respectively, deal with Education and Recreation.

The author has succeeded in presenting the subject of health in relation to other sociological factors in a well balanced, forceful manner. Health workers who are considering their relationship to other community activities, and persons who are engaged in educational and recreational activities, as well as students of sociology, will find this an interesting and valuable reference.

IRA V. HISCOCK

A Child's Book of the Teeth—*By Harrison Wader Ferguson, D.D.S. Yonkers, N. Y.: World Book Company,* 1932. 106 pp. Price, $.68.

This is a revised and enlarged edition of a charming little book which ought to interest parents and teachers as well as children. The illustrations, which are by the author himself, are amusing and clever as well as instructive. Adequate emphasis seems to be given to diet in its relationship to teeth and at the same time the subject of cleanliness is not overlooked. The toothbrush drill is retained, though not perhaps in its pristine glory. A good deal of ritualistic hokum that used to attach to this device, though presumably it has some teaching value.

The book can be heartily recommended to all who are concerned with teaching dental hygiene to children.

MERRILL E. CHAMPION

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

Heart Disease—"In New York City, for the population as a whole, there is no evidence of any increase in the real death rate from heart disease." Let the viewers-with-alarm take note.

BOLDUAN, C. F., and BOLDUAN, N. W. Is the "Appalling Increase" in Heart Disease Real? J. Prev. Med., 6, 4:321 (July), 1932.

Finding Tuberculosis Early—Modern tuberculosis case-finding calls for tuberculin testing all children and X-raying the reactors; where X-rays are suspicious a complete physical examination is indicated. So concludes this excellent Detroit study.

BRACHMAN, D. S. Modern Case-Finding in Tuberculosis. Am. Rev. Tuberc., 26, 1:89 (July), 1932.

Physical Impairments and Longevity—Included in this important study are a list of physical impairments found in "well" adults, defects considered not sufficiently serious to exclude the victims from life insurance but which did result in excess mortality.

BRITTEN, R. H. The Physical Impairments of Adult Life; Association with Subsequent Rates of Mortality. J. Prev. Med., 6, 4:249 (July), 1932.

Measures of Health—The conclusions of this critical summary of medical examination records—that statistics derived from health examinations are valueless as *absolute* measures of health but are of incalculable value in their *relative* comparisons—make the paper one which every health worker should take to heart.

BRITTEN, R. H., and GODDARD, J. C. A New Measure of the People's Health. Milbank Quart. Bull., 10, 3:223 (July), 1932.

Smallpox Mild and Severe—No evidence can be found to indicate that mild smallpox has ever reverted to the classical type. The many outbreaks of the severe form probably are due to importations. These conclusions may well be remembered by vaccination propagandists who will still have plenty of ammunition.

CHAPIN, C. V., and SMITH, J. Permanency of the Mild Type of Smallpox. J. Prev. Med., 6, 4:273 (July), 1932.

Endemic Typhus—Evidence pointing to the rat flea as the common vector of endemic typhus from rat to rat and rat to man is summarized. It is suggested that epidemics of louse-borne typhus may have their origin from infection transmitted from rat to man by fleas.

DYER, R. E., *et al.* Endemic Typhus Fever in the United States. J. Infect. Dis., 51, 1:137 (July-Aug.), 1932.

Smallpox in Fitchburg—Only 3 of 60 cases of smallpox occurring in the Fitchburg (Mass.) epidemic had been vaccinated before exposure and none of these had been vaccinated within 45 years. Yet the antivaccinists (from other towns who weren't exposed) raged as usual.

FEEMSTER, R. F., *et al.* The Recent Smallpox Outbreak in Fitchburg. New England J. Med., 207, 2:82 (July 14), 1932.

School Children's Ears—In a group of nearly 10,000 children, 3.5 per cent showed definite defective hearing. Among them were many with hypertrophied and infected tonsils and adenoids. That this condition cannot be ignored by school authorities is a reasonable conclusion.

FREUND, E. M. Hearing Survey, Public Schools, Albany, N. Y. New York State J. Med., 32, 13:791 (July 1), 1932.

Heresy About Colds—Findings that will make the health propagandist

that there is no evidence of association Dissolved Oxygen Determi

tear his hair are reported in this paper: There was no significant difference in the number or severity of colds suffered by a group of persons who slept with windows only partially open as compared with another group of fresh air enthusiasts who threw their windows wide.

The same was true of groups of persons that exercised outdoors less than 8 and more than 8 hours per week in summer and less than 4 and more than 4 in winter.

GAFAFER, W. M. Hardening Procedures and Upper Respiratory Disease (Common Cold). Am. J. Hyg., 16, 1:233 (July), 1932.

Amebic Dysentery Test—Studies are reported which show complement fixing substances in persons suffering from amebic dysentery.

HEATHMAN, L. Studies of the Antigenic Properties of Some Free Living and Pathogenic Amebas. Am. J. Hyg., 16, 1:97 (July), 1932.

Tuberculosis and Pregnancy—"From the evidence obtained from a study of 470 cases of pulmonary tuberculosis, we conclude that pregnancy does not have a marked effect on the progress of tuberculosis. In fact, the evidence is striking that the phenomena are independent of one another." So concludes the second of two papers, the first of which finds abortion rarely indicated if adequate treatment is given in pregnancy.

JENNINGS, F. L., *et al.* Pregnancy in the Tuberculous. Am. Rev. Tuberc., 25, 6:673 (June), 1932.

Mottled Enamel—The continuous use of domestic water containing 2 p.p.m. of fluorine will result in interference with enamel calcification of the teeth, and the damage will be permanent and irreparable. The only solution is the abandonment of a fluorine tainted water supply.

MCKAY, F. S. Tooth Enamel Mottled by Water. Water Works Eng., 85, 13:790 (June 29), 1932.

A Milk-Borne Paratyphoid Epidemic—This Canadian epidemic was caused by faulty operation of a pasteurizing plant which permitted raw milk to be bottled by mistake. The need for adequate supervision of pasteurization is amply demonstrated.

MCKAY, A. L., *et al.* An Epidemic of Milk-Borne Paratyphoid Fever. Canad. Pub. Health J., 33, 7:303 (July), 1932.

Changing Diets—The author says: "There are signs that many of our adolescents are growing somewhat more rapidly than in former generations. Is this an outcome of our modern education and advertising? Is it a wholesome trend? It is too early to answer these questions with conviction; but it suggests that our menus have indeed changed."

MENDEL, L. B. The Changing Diet of the American People. J. A. M. A., 99, 2:117 (July 9), 1932.

Temporary Sanitation—Sanitarians who may some time be faced with the job of providing temporary sanitary conveniences for large crowds will wish they had read this account of the experience at Yorktown, Va., when 120,000 persons descended upon a town of 480 souls.

MILLER, A. P. Keeping a Celebration Area Clean. Munic. San., 3, 7:280 (July), 1932.

Gonorrheal Vaginitis—This symposium on the subject of gonorrheal vulvovaginitis considers the problem from the standpoint of the clinician, the institution, the pediatrician, and the school physician.

NELSON, N. A., *et al.* Gonorrheal Vulvovaginitis. New England J. Med., 207, 3:135 (July 21), 1932.

Sinuses and Colds—The conclusion of an X-ray study of nasal sinuses is

that there is no evidence of association between the size of the frontal sinus and the number or duration of attacks of the common cold.

PALMER, C. E. Relation Between Size of Frontal Nasal Sinuses and (1) Attacks of Upper Respiratory Disease (Common Cold) and (2) Certain Nose and Throat Conditions. Am. J. Hyg., 16, 1:224 (July), 1932.

Childhood Mortality Trends—The infant mortality rate in upstate New York declined 33 per cent from 1915 to 1928, whereas the drop in the death rate in the age group 1–4 was considerably greater, 47 per cent. After a lot of statistical study the conclusion is reached that those children in the pre-school group are not receiving as much care as infants and school children. If this is so, they certainly seem to thrive on neglect.

PARKHURST, E. Trends in Childhood Mortality in New York State (exclusive of New York City). New York State J. Med., 32, 13:785 (July 1), 1932.

Drug Addiction—This epidemiologic study of drug addiction points out that there are both a local and a general responsibility for preventive measures. The federal program is described.

TREADWAY, W. L. Drug Addiction and Measures for Its Prevention in the United States. J. A. M. A., 99, 5:373 (July 30), 1932.

Dissolved Oxygen Determination—The Winkler method of determining dissolved oxygen is described in working detail in this committee report.

THERIAULT, E. J., *et al.* The Determination of Dissolved Oxygen by the Winkler Method. Sewage Works J., 4, 3:413 (May), 1932.

Health Economics—Here is the promise for a solution to the vexing problems of providing medical care. If intelligent leadership can be given to the forces of social discontent, improved medical and health services may result; so says the Chairman of this highly important commission.

WILBUR, R. L. The Economics of Public Health and Medical Care. Milbank Quart. Bull., 10, 3:169 (July), 1932.

Fertility of White Women—"All this evidence seems to show that an important . . . cause of the rising fertility of native-white women since 1900 . . . has been the slow permeation of the class of native-white women within the present century by American-born daughters of foreigners carrying some part of the high fertility of their stock and thus counterbalancing the tendency to a fall in the birth rate of native-white women . . ."

WILCOX, W. F. Changes Since 1900 in the Fertility of Native-White Wives. Milbank Quart. Bull., 10, 3:191 (July), 1932.

BOOKS RECEIVED

YOUR TEETH AND THEIR CARE. By Carl W. Adams. St. Louis: Mosby, 1932. 141 pp. Price, $1.25.

MILK PRODUCTION AND CONTROL. A Publication of the White House Conference on Child Health and Protection. New York: Century, 1932. 392 pp. Price, $3.00.

PASTORAL PSYCHIATRY AND MENTAL HEALTH. By John Rathbone Oliver. New York: Scribner, 1932. 330 pp. Price, $2.75.

THE WISDOM OF THE BODY. By Walter B. Cannon. New York: Norton, 1932. 312 pp. Price, $3.50.

LEAGUE OF NATIONS. HEALTH ORGANIZATION. Report of the Reporting Committee on Maternal Welfare and the Hygiene of Infants and Children of the Pre-School Age. Boston: World Peace Foundation, 1931. 75 pp. Price, $.50.

DIRECTORY OF CLINICS AND HEALTH STATIONS. New York: New York Tuberculosis & Health Association, 1932. 661 pp. Price, $.40.

THE PURCHASE OF MEDICAL CARE THROUGH FIXED PERIODIC PAYMENT. By Pierce Williams. New York: National Bureau of Economic Research, Inc., 1932. 308 pp. Price, $3.00.

Application for Membership

NEWS FROM THE FIELD

N.T.A. RESEARCH FELLOWSHIP ANNOUNCED

THE National Tuberculosis Association announces Mary E. Bateman as the Research Fellow for the year 1932–1933. Miss Bateman, who has for the past year been connected with the New York State Department of Social Welfare, at Albany, will be a member of the National Tuberculosis Association Committee on Social Research.

DELTA OMEGA PRESENTS SCROLL AND KEY TO DR. RAVENEL

MAZYCK P. RAVENEL, M.D., at the banquet of the Delta Omega at Ann Arbor, where he gave an address in July, was presented with the scroll and key of the organization. He is the ninth person who has ever had this conferred upon him.

HARTLEY AWARD TO DR. PARK

THE public welfare medal, for eminence in application of science to public welfare, was awarded to Dr. William Hallock Park, Fellow A.P.H.A., of New York, for his work as head of the Research Laboratories of the New York City Health Department and as a leader in research and application of scientific discoveries to prevention of disease. This medal is awarded from a fund established in memory of Marcellus Hartley.

MICHIGAN MIDSUMMER CONFERENCE

THE Midsummer Conference of the Michigan Public Health Association was held in conjunction with the week-end institute at the University of Michigan, Ann Arbor, Mich., July 16. Among the subjects discussed were Heart Disease, Milk, Health Insurance, Dental Health Service in Schools, and Typhoid Fever. Dr. Ravenel gave an address on Milk.

PERSONALS

DR. ARTHUR M. JOHNSON has been appointed Health Officer of Rochester, N. Y., to succeed Dr. George W. Goler who resigned on July 1, after 35 years of continuous service. Dr. Johnson has been connected with the Rochester Health Bureau for some time.

MIGUEL CESPEDES ACOSTA, M.D., of Havana, Cuba, member A.P.H.A., was recently appointed Secretary of Sanitation and Charities of the Republic of Cuba. In the announcement of this appointment it was stated that there will be "no political interference in public health affairs, improving the tenure of public health works and an honest administration."

CONFERENCES

September 6–9, International Union Against Tuberculosis, The Hague.

September 12–19, American Hospital Association, Detroit, Mich.

September 26–October 1, National Congress of Parents and Teachers National Board of Managers, Chicago, Ill.

October 3–7, Twenty-first Annual Safety Congress and Exposition, Washington, D. C.

October 22–24, Conference of State Sanitary Engineers, Washington, D. C.

October 24–27, 61st Annual Meeting, American Public Health Association, Washington, D. C.

November 14–18, Tenth Annual Short School, Texas Public Health Association, Dallas, Tex.

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